

Pequot Pond

Restoration Project



Final Report

November 2004



Prepared by:
Pioneer Valley
Planning Commission

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Funding provided by
Lakes and Pond Demonstration Grant from the
Massachusetts Department of Conservation and Recreation

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Acknowledgements

Pioneer Valley Planning Commission would like to acknowledge the contributions of the following project partners and participants:

Nancy Pasquini, Hampton Ponds Association
Mark Noonan, Winding River Land Conservancy
Thomas Gentile, Southampton Conservation Commission
Dick Hartwell, Westfield Conservation Commission
Ken Taylor, Westfield Conservation Commission
Mike Vedovelli, Westfield Community Development
Alec MacLeod, Environmental Scientist
Richard Brazeau, Massachusetts Department of Conservation and Recreation
Center for Human Development
Hampton Ponds State Park Staff

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I. EXECUTIVE SUMMARY

In June of 2002, the City of Westfield was awarded a Lakes and Ponds Demonstration Grant from the Executive Office of Environmental Affairs' Department of Conservation and Recreation. The purpose of the grant was to implement recommendations from past Diagnostic and Feasibility Studies and water quality assessments to restore the recreational capacity of Pequot Pond in the communities of Westfield and Southamptton, Massachusetts. The project was a collaboration between several organizations including the City of Westfield, Pioneer Valley Planning Commission, the Winding River Land Conservancy, the Hampton Ponds Association, and the Town of Southamptton Conservation Commission.

Working with watershed residents to control the abundant Canada geese population was a major objective. To this end, a demonstration vegetative buffer was installed at Hampton Ponds State Park, south of the public swimming beach. Student volunteers worked with staff from the Pioneer Valley Planning Commission and volunteers from the Hampton Ponds Association to design and install the buffer. Still thriving after its second year of growth, the buffer is successfully deterring geese from coming ashore at its location.

After much searching for a potential waterfront parcel for acquisition, the Winding River Land Conservancy worked successfully with Oak Realty Inc. to purchase five parcels along the south shore of Pequot Pond on Old Apremont Way, Long Pond Road, and Sanders Road. Once the land was acquired, a cottage with a failing septic system was removed and approximately 400 feet of shoreline was restored with native plants and erosion control materials. The labor force for this project involved approximately 20 youth-at-risk from the Department of Social Services' Center for Human Development. Working side-by-side with environmental professionals, the teens were taught ecological principles and given insight into career opportunities in the environmental field.

Outreach to watershed residents about controlling nonpoint source pollution was an important component of the project. Outreach included a rain barrel sale, two landscape audits, and distribution of literature throughout the watershed. Additionally, updates about the project were given at regular Hampton Ponds Association meetings.

In support of the stormwater management and environmental restoration work that was accomplished through this project, PVPC worked with the City of Westfield and the Town of Southamptton to develop two bylaws for each community that would meet their NPDES Phase II requirements: Illicit Connections and Discharges to the Storm Drain System, and Erosion and Sediment Control for Stormwater Management. The bylaws for Southamptton were developed under a separate grant funded by the Massachusetts Environmental Trust.

Several changes to the original scope of work were made within the first year resulting in the elimination of a roadway drainage improvement project and an aquatic herbicide treatment program. The funding for these tasks was re-allocated to land acquisition under the Winding River Land Conservancy.

II. INTRODUCTION

Background

Pequot Pond is an important and highly utilized recreational resource for the City of Westfield, Town of Southampton, and the City of Holyoke. Classified as a Class B waters (MA Surface Water Quality Standards, 1996), Pequot Pond is part of the Hampton Ponds and is a Category 5 (requires TMDL) water body for nutrients, exotic species, and organic enrichment / low dissolved oxygen (Massachusetts 2004 Integrated List of Waters, April 2004). The goal of this restoration project is to advance efforts to remove Pequot Pond from the 303d list by reducing nutrient and sediment loading through implementing several non-structural BMPs including education and outreach, purchasing land in the watershed, and building cooperation between all watershed stakeholders.

The Hampton Ponds are a series of glacial kettle ponds. These ponds were formed as ice blocks were buried under glacial melt-water and debris. As the ice melted, a depression was left that formed the pond's basin. The basin has a maximum depth of approximately 25 feet (Lycott, 1986). Pequot Pond has several small tributaries which, under normal rainfall conditions, flow into the pond: one from Long Pond on the western shore, one from the wetlands to the north of the pond, and one that flows into Pequot approximately halfway up the eastern shore. In addition, several intermittent streams drain into the pond. The outlet of the pond is located at the southern end and drains into Horse Pond, also 303d listed for noxious aquatic plants. The upland areas of the watershed are glacial tills of the Chalton-Paxton-Woodbridge Association. The soils in the immediate vicinity of the pond are Hinckley loamy sand, noted to be deep and excessively well-drained.



The Department of Environmental Management's Hampton Ponds State Park and boat launching ramp, located at the south end of the pond along Route 202, are highly utilized recreational resources. The pond is used for swimming, boating, and fishing. Water quality monitoring at the State Park swimming beach in 2000 found elevated levels of bacteria that resulted in beach closures that summer. Possible sources of bacteria

include failing septic systems around the pond, the growing goose population, pet waste from residential areas, agricultural activities, and discarded diapers left by beach goers. A Diagnostic and Feasibility Study prepared in 1986 by Lycott Environmental Research, Inc. identified failing septic systems, siltation and nuisance vegetation as sources of impairment to the pond. In 2002-2003, the Department of Environmental Protection funded a concurrent study conducted by Alec MacLeod to investigate bacteria sources and actions for addressing them.

Historically, the residences surrounding the pond were built as summer homes. Today, the watershed is dominated by year-round residential land use with some agricultural and commercial activity. Westfield and Southampton have conducted several projects to control nutrient and sediment loading to the pond. Activities taken to date include:

- Installation of a vegetated swale on Massachusetts Department of Environmental Management (DEM) property along Italian Club Road. DEM also purchased and demolished several houses along the southern lakeshore and the septic system at the State beach has been upgraded.
- Boards of Health in Westfield and Southampton have conducted periodic septic tank inspections. Southampton is involved in the CSMP program.
- Southampton regularly cleans its catchbasins and has replaced or installed 126 new catchbasins with 3-foot sumps. Southampton also conducts routine street-sweeping.
- Westfield has a catch-basin clean-out schedule in the Pequot Pond area of town.

MA DCR Lakes and Ponds Demonstration Grant

In June 2002, the Massachusetts Department of Conservation and Recreation awarded a Lake and Pond Demonstration Grant to the City of Westfield in the amount of \$290,140. An additional \$131,300 was contributed as a cash and in-kind match from the partnering organizations and communities, increasing the total project budget to \$421,440. The original purpose of the project was to implement recommendations from past diagnostic feasibility studies and to restore the recreational capacity of Pequot Pond to swimmable waters, i.e. primary contact. The project was also to address sedimentation problems from roadway runoff, and to educate the public about Best Management Practices that can be implemented to improve water quality. The project also featured a partnership with the Winding River Land Conservancy for the purchase of waterfront property and the restoration of a riparian buffer.

Pequot Pond Advisory Committee

An Advisory Committee consisting of representatives from each of the partnering organizations and municipalities was formed. Table 1 includes a list of the committee members. Pequot Pond Advisory Committee meeting minutes are included in Appendix A.

Table 1: Pequot Pond Advisory Committee Members

Anne Monnelly DEM, Office of Water Resources 251 Causeway Street, Suite 700 Boston, MA 02114-2104	Mike Gildesgame DEM, Office of Water Resources 251 Causeway Street, Suite 700 Boston, MA 02114-2104	Rich Brazeau, DEM DEM P.O. Box 484 Amherst, MA 01004
Mike Vedovelli Community Development 59 Court Street Westfield, MA 01085	Ed Cauley, Superintendent Highway Department 8 East Street Southampton, MA 01073	Ken Taylor Conservation Commission 59 Court Street Westfield, MA 01085
Charles Darling, Superintendent Water Department 59 Court Street Westfield, MA 01085	Michael Parker, EOEA Westfield Basin Team Leader Hampton Ponds State Park 1048 North Road Westfield, MA 01085	

Table I cont'd

Mark Noonan Winding River Land Conservancy POBox 1836 Westfield, MA 01086	Nancy Pasquini Hampton Ponds Association 975 Old Stage Road Westfield, MA 01085	Larry Tori Hampton Ponds State Park 1048 North Road Westfield, MA 01085
Mark Cressotti, City Engineer 59 Court Street Westfield, MA 01085 POBox 1764 Westfield, MA 01086	Westfield River Watershed Assc. Association P. O. Box 1764 Westfield, MA 01085	Anne Capra Pioneer Valley Planning Commission 26 Central Street West Springfield, MA 01089
Matthew DelMonte Pioneer Valley Planning Commission 26 Central Street West Springfield, MA 01089	Christopher Curtis Pioneer Valley Planning Commission 26 Central Street West Springfield, MA 01089	Alec MacLeod 10 Main Street North Orange, MA 01364

Original Scope of Work and Modifications

Roadway Drainage Improvements



The first year of the project was devoted to planning for roadway drainage improvements on Birch Road in Westfield and Cottage Avenue in Southamptton. Previous studies had identified these two subwatersheds as contributing significant sediment loading to the pond. Numerous meetings were held between the Department of Public Works from Southamptton and Westfield, DCR, and PVPC to develop design and engineering plans that would meet DCR's standards for a Demonstration Grant and provide stormwater retention and treatment in the upper watershed instead of one large end-of-pipe system. Unfortunately, an agreement could not be reached regarding an appropriate design and DCR transferred their portion of the funding for this task into the land acquisition component of the project.

QAPP Development, Training, and Sampling

In preparation for the roadway drainage construction, PVPC worked collaboratively with Anne Monnelly and Jim Straub at DCR to develop a Quality Assurance Project Plan (QAPP) to guide the water quality monitoring component of the project. All construction projects funded with State money for the purpose of water quality improvement must provide both pre- and post-construction water quality data for demonstrating the effectiveness of the applied technology in improving water quality conditions.

The actual sampling was to be preformed by citizen volunteers. PVPC and DEM collaboratively revised the Volunteer Environmental Monitoring Network's (VEMN) Field Water Sampling Manual for Volunteers so that it applied to the sampling to be performed under this project. The manual provided a step-by-step guide for volunteers

to follow during sampling events. DCR provided training for volunteers on July 8, 2002 at the Hampton Ponds State Park. Table 2 includes a list of those in attendance at the training. A copy of the VEMN is included as Appendix B. The draft QAPP is included as Appendix C.

PVPC collected one pre-construction round of wet weather water samples on November 13, 2002 and delivered the samples for analysis to Berkshire Enviro Labs in Lee, MA. Although precipitation for the storm event was recorded by the National Weather Service at .71 inches, no flow was observed at any of the three sampling locations. One sample was collected from a depression at the outfall of the Birch Road culvert (Site BR2) and analyzed. Data was inconclusive. Data results are included in Appendix D. The lack of flow at the project site, in addition to the difficulties in developing an approvable design plan, compounded the decision by DCR to reallocate the funding for this task to the land acquisition component.

Table 2: Participants in Sample Collection Training

Robert A. Dame 23 Bleumer Road Southampton, MA	Chris Taylor 1 Bullhead Road Southampton, MA
Joe Giroux 60 Pequot Point Road Westfield, MA	Anne Capra and Robin Simmen Pioneer Valley Planning Commission 26 Central Street West Springfield, MA
Anne Monnelly – Trainer DEM, Office of Water Resources 251 Causeway Street, Suite 700 Boston, MA 02114-2104	Jim Straub – Trainer DEM, Office of Water Resources 251 Causeway Street, Suite 700 Boston, MA 02114-2104

Invasive Aquatic Weed Control

Under the original scope of work, the City of Westfield intended to subcontract the application of chemical herbicides to control invasive aquatic weeds in the pond. The treatments were to be in accordance with a previous weed management plan prepared by Lycott Environmental Research, Inc. However, DCR found that the previous management plan needed to be updated and decided that to justify an herbicide application, pre- and post-application plant surveys were needed. The surveys were to include weed mapping, a list of species and distribution, and photo documentation. Westfield's Department of Community Development prepared a Request for Responses (RFR) for the treatment and additional information. However, after further consideration between DCR and Westfield, it was decided that both the City's matching funds and DCR's commitment would be better used in the land acquisition component of the project.

III. LAND ACQUISITION & SHORELINE RESTORATION OF FREE BEACH

In early 2004, the Hampton Ponds Association (HPA) received a Five Star Challenge Grant from the National Fish and Wildlife Foundation for the restoration of approximately 200 feet of shoreline along the south shore of Pequot Pond. Alec MacLeod, a private consultant, had worked with HPA to write the grant and was working as a partner on the project. Since the focus area for the Five Star Challenge Grant overlapped with the area identified by the Winding River Land Conservancy for restoration, the Lakes and Ponds Advisory Committee agreed to coordinate the two grants and pool resources into one larger shoreline restoration project.

Land Acquisition and Removal of Cottage

Winding River Land Conservancy worked with the Hampton Ponds Association to identify land and property owners that would be suitable candidates for purchase and restoration. After some research and meetings with landowners, Winding River began negotiations with Oak Realty, Inc. for the purchase of five parcels along the southwest shore of Pequot Pond. One parcel located at 142 Old Apremont Way included the area known as Free Beach and an old cottage. The other parcels were on the remaining three corners of the intersection of Old Apremont Way and Long Pond Road, as well as a small strip of land on the East Side of Sanders Road.

The purchase price for the five parcels was \$225,000. Of that amount, the City of Westfield contributed \$30,000 in matching funds from their Community Preservation Fund. The match was appropriated by the Westfield City Council on August 19, 2004.

The first phase of the shoreline restoration was the removal of the cottage at 142 Old Apremont Way. A failing septic system on the site had been a source of pollution to the pond for many years. Garbage and other landscape debris often found its way into the pond below the house. Permitting for the demolition and removal of the cottage was performed by Alec MacLeod. Mr. MacLeod filed a Notice of Intent with the Westfield Conservation Commission and the Department of Environmental Protection on behalf of the Winding River Land Conservancy. An order of Conditions was issued in February 2004. In mid-March 2004 while the pond was still blanketed by a thick sheet of ice, the cottage was demolished and removed, with only the foot print of the concrete foundation left in place. The covering of ice on the pond allowed any scattered debris to be easily swept up and removed without contaminating the surrounding soils and water. The Hampton Ponds Association requested that the foundation be left intact so that it may be used in the future as a potential landing for passive boating.

Shoreline Restoration

The project area consists of approximately 480 feet of shoreline along the southern edge of the pond parallel to Old Apremont Way. The 480 feet is not entirely contiguous and is interrupted by segments of bank thickly vegetated with a shrub understory and a forest canopy. The largest segment identified for restoration includes 280 feet of shoreline including the area known locally as Free Beach at the intersection of Old Apremont Way and Long Pond Road. The second contiguous area is approximately 160 feet at 142 Old Apremont Way at the site of former cottage site. Two additional 20-foot segments to the east of the cottage site were also restored.

All four sites identified for restoration had been heavily used and abused by people seeking waterfront recreation. Fisherman, although considered a less abusive class of users, had worn paths to the water's edge that were subject to erosion and a source of sediment loading to the pond. All-terrain vehicles (ATVs) criss-crossed the sandy slopes causing severe erosion. Trucks and cars were often parked on the more level areas. Snow mobiles traversed the site all winter long, even after bare soil had been exposed. Each of these uses compounded the erosion caused by the other, eventually undercutting the road edge and causing crumbling of the pavement in these areas. Excessive amounts of fish tackle, fast food containers, alcoholic beverage containers, and other assorted items littered the entire shoreline. Over the three week period that the restoration work occurred, buried scraps of garbage were continually unearthed such that a 15-gallon trash bag of debris was removed from the site each day. Shards of glass and broken bottles were taken out of the water daily along with other sunken bits of trash.

The labor force for the project was a component of the HPA's Five Star Challenge Grant program. Approximately twenty (20) at-risk youth were coordinated through two Department of Social Services (DSS) programs in Springfield and Westfield called the Center for Human Development (CHD) and Gandara. The CHD youth came from several foster homes for young men and women in Westfield known as Bridge Programs. Gandara is a court mandated alternative to jail rehabilitation program for young men.

Description of Work

The shoreline restoration was performed over a three week period. The fencing at the site was installed in the late Fall of 2004 after all work at the site had been completed. The following is a step-by-step description of the site work as it was performed.

1) Install Coir Logs

Twenty-foot long coir logs were placed at the water's edge and staked with 24" hardwood stakes. Proper staking is critical for successful installation. An adequate number of stakes must be used to insure that the logs are not dislodged from the shoreline. On very low energy sites, such as small ponds, as few as seven stakes per log can be used. For high energy sites, up to 20 stakes per log can be needed, installed through the coir log netting and cinched together with rope or twine.



At Pequot, two different staking patterns were used. The logs on the western edge of the project site were installed with 20 stakes per log, cinched together with twine. This area receives the fetch off the pond and required more stabilization. Boat wake is also prevalent and could cause destabilization to a poorly secured log. Along the southern shoreline, and the rest of the project area, approximately 10 stakes per log were installed through the netting. In three sections along the log, the stakes were placed opposite each other, on the water and shore sides, and cinched together with twine. In addition to boat wake, heavy use by fishermen, and potential vandals, necessitated that the logs be firmly secured.



2) Plant Coir Logs

Once the coir logs were secured, plants were installed in a triangular pattern across the top of the log, spaced roughly 12 inches apart. Ideally, the plants should be installed an inch or so deeper into the log than the plant plug is long. Due to availability problems, the supplier delivered premium density logs and regular density logs. The premium density logs were extremely difficult to make holes in for the plants. These logs are generally used in high flow areas where they are subject to high stress and can be degraded quickly. Therefore, planting the logs took longer than expected. A combination of pick axes, serrated knives, and hand trowels were used to make the holes. In the regular density logs, it was possible to make a hole by simply pushing apart the coir matting by hand.



The plants came in 2 inch plugs. Well-watered plugs were placed into the holes and any extra coir matting was fit snugly around them to prevent the plugs from drying out.

3) Build First Soil Lift

The first soil lifts were constructed with ECSC-2B twenty-four month straw-coconut biodegradable double net blankets. These blankets measuring 7 feet wide by 120 feet long are ideal protection from erosion and for the establishment of vegetation providing for up to 24-months of turf reinforcement. They are 100 percent biodegradable erosion control blankets designed for use in moderate to heavy rainfall and runoff flows, and on slopes of up to 1:1 grade. The blanket is made with a mix of 70 percent agricultural straw and 30 percent coconut fiber, between two layers of organic jute netting. This blanket provides extra protection for extended vegetation growth.



The blankets were laid out horizontally along the shore side of the coir logs, dragged out over the coir log so that three feet of blanket was left on the shore, and back filled with 8 to 12 inches of soil over the entire three foot wide mat, and seeded with a New England Wet

Mix Seed Mix from New England Wetland Plants. Once the soil was in place and seeded, the remaining four feet of blanket that had been dragged out over the log, was pulled back over the soil and stapled into place. The blankets must be secured in direct contact with the soil for proper seed germination and growth through the blanket.

4) Plant First Soil Lift



Once the seed mix was applied and the blankets were securely stapled, vegetative plugs were planted one per square foot approximately. The mesh blanket was pulled apart to accommodate the two-inch plug and a hole twice as deep as the plug was dug in the soft loam with a hand trowel. The plug was placed in the hole and covered firmly with soil. After all of the plugs were planted, they were watered by hand with watering cans and buckets.

5) Build Second, Third, and Fourth Soil Lifts

The steep slope and significant erosion along the eastern half of the Free Beach site necessitated the installation of three additional soil lifts to stabilize the site. These lifts were built with an ECC-2B thirty-six month coconut biodegradable double net blanket. These blankets last longer and are thicker than the ECSB and are made from 100 percent coconut fiber. The blanket is slow to degrade, providing the most extended temporary erosion control available.

To install the upper soil lifts, 8 inch tall by 12 foot long planks were used to support the front edge of the lift while it was being filled with soil. Stakes were installed about 8 inches from the end of the first soil lift blanket. The planks were leaned against the stakes vertically. The ECC blankets were then rolled out along the length of the planks and pulled out over the planks such that three feet of blanket remained. This area was then backfilled with soil to a depth of 8 inches, raked, and seeded with a Wildlife Conservation Seed Mix from New England Wetland Plants. The blanket was pulled back over the seeded area and stapled. Again, it was important for the blankets to have direct contact with soil on top for seed germination and stability of the lift. When the upper blanket had been stapled, the planks were pulled out and the stakes removed. This process was repeated for the third and fourth lifts.

6) Install Erosion Control Blankets in Upland Areas

After the soil lifts were installed, the remaining project area still needed to be loamed, seeded, and covered with an erosion control mat. For the more gently sloping areas, the ECSC-2B twenty-four month straw-coconut biodegradable double net blankets were used. Roughly four to six inches of loam were first spread over the area, being careful not to disturb any areas with existing stable vegetation. Once loamed, a Wildlife Conservation Seed Mix was dispersed over the area. Next, the blankets were unrolled, making sure to include at least a four inch overlap between blankets. Once in place, the blankets were secured with staples.



To help speed up the soil stabilization by rooting process, 2,500 three inch plugs of little bluestem grass were planted in the upland areas. The plugs were spaced at one plant per every two to three square feet, depending on the area. To plant the plugs, the hole was made in the jute netting by hand, and then a hole was dug twice as large as the plug usually with a hand trowel. The plug was placed in the hole and the soil pushed back around the base of the plant. The plugs were watered by hand with watering cans for a few weeks after planting to help ensure their success.



7) Fence Site

To protect the newly germinating plants and tender plugs and shrubs, a wooden split-rail fence was installed along the road edge. Prior to the restoration project, ATVs, dirt bikes, trucks, and snow mobiles traveled up and down the sandy slopes of the site, contributing to the erosion problems. A formidable fence was absolutely critical to the success of the restoration work.

Table 3: Restoration Plants

Species	Size	Quantity	Area
Herbaceous Plants			
Blueflag Iris	Plugs	450	Coir Log
Sweetflag	Plugs	450	Coir Log
Woolgrass	Plugs	450	First Soil Lift
Burreed	Plugs	450	First Soil Lift
Green Bulrush	Plugs	450	First Soil Lift
Little Bluestem	Plugs	2,520	Uplands
Tubelings			
Black Willow	Rooted Cuttings	38	First Soil Lift
Purple-Osier Willow	Rooted Cuttings	114	Coir Log, First Soil Lift
Bankers Dwarf Willow	Rooted Cuttings	114	Coir Log, First Soil Lift
Shrubs			
Elderberry	1-gallon	10	Soil Lifts
Arrowwood	1-gallon	8	Soil Lifts
Sweet Pepperbush	1-gallon	8	Throughout
Bayberry	1-gallon	5	Throughout
Gray Dogwood	1-gallon	16	Uplands
Highbush Blueberry	1-gallon	5	Soil Lifts

Table 4: 2004 New England Conservation/Wildlife mix

SPECIES	PER CENT
Big Bluestem (<i>Andropogon gerardii</i>)	20
Switchgrass (<i>Panicum virgatum</i>)	19
Little Bluestem (<i>Schizachyrium scoparium</i>)	13
Canada Wild Rye (<i>Elymus canadensis</i>)	13
Fox Sedge (<i>Carex vulpinoidea</i>)	13
Partridge Pea (<i>Chamaecrista fasciculata</i>)	6
Fringed Brome grass (<i>Bromus ciliatus</i>)	5
Pennsylvania Smartweed (<i>Polygonum pennsylvanicum</i>)	5
Common Milkweed (<i>Asclepias syriaca</i>)	2
Nodding Bur Marigold (<i>Bidens cernua</i>)	1.5
Showy Tick-Trefoil (<i>Desmodium canadense</i>)	1
New England Aster (<i>Aster nova-angliae</i>)	1
Flat-top Aster (<i>Aster umbellatus</i>)	0.5
TOTAL	100

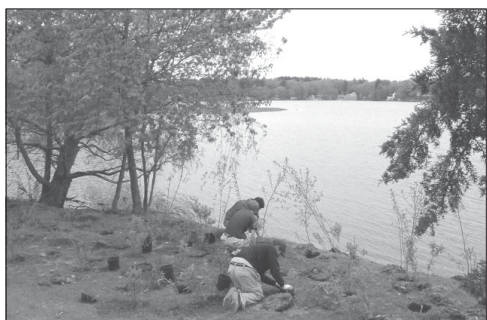
Table 5: 2004 New England Conservation/Wildlife Wetmix

SPECIES	PER CENT
Fox Sedge (<i>Carex vulpinoides</i>)	35
Hop Sedge (<i>Carex lupulina</i>)	6
Bearded Sedge (<i>Carex comosa</i>)	6
Lurid Sedge (<i>Carex lurida</i>)	6
Nodding Bur Marigold (<i>Bidens cernua</i>)	5
Soft Rush (<i>Juncus effuses</i>)	5
Grass-leaved Goldenrod (<i>Solidago graminifolia</i>)	5
Blue Vervain (<i>Verbena hastata</i>)	5
Boneset (<i>Eupatorium perfoliatum</i>)	5
Flat-top Aster (<i>Aster umbellatus</i>)	3
Hard-stem Bulrush (<i>Scirpus acutus</i>)	3
Green Bulrush (<i>Scirpus atrovirens</i>)	3
Woolgrass (<i>Scirpus cyperinus</i>)	3
Sensitive Fern (<i>Onoclea sensibilis</i>)	3
Spotted Joe-Pye Weed (<i>Eupatorium maculatum</i>)	2
Water Plantain (<i>Alisma plantago-aquatica</i>)	2
Soft-stem Bullrush (<i>Scirpus validus</i>)	2
Ditch Stonecrop (<i>Penthorum sedoides</i>)	1
TOTAL	100

IV. OUTREACH AND EDUCATION TO WATERSHED STAKEHOLDERS

Public outreach and education is an important part of any successful watershed restoration effort and is an effective non-structural BMP. Outreach conducted as part of this project included: (1) a Canada Goose demonstration site; (2) creation and distribution of BMP fact sheets and outreach materials to watershed residents; (3) landscape audits for two lakeside properties to identify low-tech BMPs and natural solutions for NPS pollution prevention and stormwater management; and (4) a rain barrel distribution program.

Demonstration Canada Goose Control Site



The demonstration site was installed as a “lake-friendly” landscaping model for homeowners around Pequot Pond and will serve as a model to be replicated at other lakes and ponds in the Commonwealth.

PVPC and DCR staff conducted site visits and selected four potential locations for goose demonstration sites. One site, located southwest of the Hampton Pond State Park beach, was chosen for the demonstration site; however, all four sites were included in the permitting process for future plantings. The demonstration parcel was identified as the most common gathering point for the geese at a highly visible public location.



PVPC filed a Request for Determination of Applicability (WPA Form1) with the Westfield Conservation Commission after approval from DEM Region 4 Headquarters and Hampton Ponds State Park staff. The Conservation Commission issued a negative determination because the planting was considered an exempt minor activity in the buffer zone pursuant to 310 CMR10.00 (The Wetlands Protection Act).

The demonstration project involved planting a 75’ by 20’ vegetated buffer of native shrubs along the shore in an attempt to physically deter Canada Geese from frequenting the pond and littering the beaches with feces. An instruction guide for landowners interested in installing vegetative buffers for the purpose of controlling Canada geese is included as Appendix E.

Public Outreach to Landowners

A series of BMP fact sheets on NPS pollution were compiled and made available to watershed residents through the Hampton Ponds Association, Inc. newsletter *The Focus*. The fact-sheets were selected and reviewed by members of the Pequot Pond Restoration

Advisory Committee. The Focus was mailed to approximately 1,500 watershed and local residents in the winter of 2003. Technical assistance regarding NPS pollution was also offered in the newsletter. A copy of the newsletter is included in Appendix F.

The following fact-sheets were selected by PVPC and the Pequot Pond Watershed Restoration Project Advisory Committee to better manage watershed land and help prevent NPS pollution from degrading Pequot Pond.

- A topographic map of the Pequot Pond watershed boundary
- An educational brochure on NPS pollution in lakes and ponds
- A septic system reference guide for homeowners
- How to use rain barrels to collect and recycle rainwater
- A DEP fact-sheet on how to establish vegetated buffer strips along lakes
- Pointers for reducing NPS from boating and marinas (maintenance, sewage, waste, etc.)
- Easy tips and good reference sources on lawn care in an environmentally sensitive way
- How to construct a rain garden to help solve stormwater pollution problems and encourage recharge

Landscape Audits (Technical Assistance)

Residents in the vicinity of Pequot Pond were offered a free consultation by PVPC to help identify low-tech BMPs for nonpoint source pollution prevention and stormwater management. In all, only two residents requested consultations: Nancy Valego and Gary Krause. Topics covered during the site visits included invasive plant control, general watershed ecology, sources of nonpoint source pollution, strategies for managing runoff such as rain barrels, vegetated buffers, proper disposal of pet waste, and proper septic system care.

PVPC offered several recommendations to both Ms. Valego and Mr. Krause including: controlling invasive plants, reducing leaf litter, stabilizing the shoreline slope, and planting perennial shrubs, grasses, and wildflowers. In addition, several species of native vegetation were purchased and planted at the Valego property. A full report on each of these audits is included in Appendix G.

Rain Barrel Distribution effort

In July of 2003, the PVPC worked with the New England Rain Barrel Company and offered rain barrels at a special price for residents living in the vicinity of Hampton Ponds in Westfield, Holyoke, and Southampton. The first 40 residents living in the vicinity of the ponds were given the opportunity to purchase a 55-gallon rain barrel for \$30 (regularly \$85). Advertisement of this offer was published in a local newspaper and fliers were posted at local gathering spots. In all, only 5 residents took advantage of this offer. Copies of the flyer and press release are included in Appendix H.

Display for Southampton

PVPC prepared a lake restoration display for the town of Southampton. This table-top display will be used by the Southampton Conservation Commission to provide general information about nonpoint source pollution in Southampton.

V. STORMWATER MANAGEMENT BYLAWS

PVPC worked with a committee of department heads from the City of Westfield in drafting two bylaws for stormwater management: Illicit Discharge Detection and Elimination Ordinance and Erosion and Sediment Control Ordinance. In addition to offering greater protection to the pond from pollutants, the bylaws meet the requirements of EPA's National Pollutants Discharge Elimination System (NPDES) Phase II. PVPC had worked previously to develop these bylaws for Southamptton under a grant from the Massachusetts Environmental Trust. Both communities have not yet adopted the bylaws. Copies of the bylaws are included in Appendix I.

APPENDICES

A: Meeting Minutes

MEMORANDUM

To: Joe Pescitelli, Assistant Director, City of Westfield Office of Community Development
Michael Vedovelli, City of Westfield Office of Community Development

From: Anne Monnelly, DEM Lake and Pond Initiative Manager

Cc: Chris Curtis and Anne Capra, Pioneer Valley Planning Commission
Mike Parker, EOE Westfield Watershed Team Leader

Subject: Next steps for finalizing your contract

Date: December 20, 2001

This memo summarizes the items discussed during the first project meeting for the Pequot Pond Watershed Restoration Project, held on December 7, 2001. It also provides information on the forms required to finalize your contract, and includes instructions on how the forms should be filled out.

SCOPE OF SERVICES

Based on our discussions, the City of Westfield and its project partners agreed to provide additional information for Tasks 1 through 7 and 9 as specified below. Please provide this information electronically, as an amendment to the existing scope. In addition, please submit an electronic version of the original scope of services and a revised budget that reflects any changes to the scope. If you prefer to amend the existing scope, that is also acceptable. All items should be submitted to Anne Monnelly at anne.monnelly@state.ma.us

Task 1 Roadway Drainage Improvements

- We understand that a meeting will be held *as soon as possible* to develop this task. In order to meet the intent of the grant program, planned improvements to roadway drainage should incorporate watershed-friendly design and construction techniques and should consider innovative stormwater management practices wherever possible. The subwatershed to the problem roadway should be delineated.
- Particularly as this task is the single largest component of the grant, it is important that the proposed activities at Cottage Avenue and Birch Road (and other areas) demonstrate techniques and/or technologies that fit within the grant's intent. The installation of traditional catch basins and other drainage structures do not generally fall within that intent.

Task 2 Quality Assurance Project Plan

- The QAPP does not need to be approved by DEP, but should include a sampling plan approved by DEM, and should follow SOPs provided by LAPA West. The plan should specify all individuals that will conduct monitoring and indicate the type of training they have received.
- The QAPP should include the monitoring activities specified in Task 5.
- Bacteria should be included among parameters to be monitored.
- Efforts should be made to capture early flush for pre- and post-construction precipitation events.

Task 3 Advisory Committee Meetings

- Specify potential members of the advisory committee. The DEM facilities manager for Hampton Ponds (Larry Torrey) should be included on the committee, and committee tasks and responsibilities should be specified, along with a meeting schedule.
- Include as a deliverable creation of an email distribution list.

Task 4 Acquire Land Abutting Pequot Pond and Develop a Wetland Buffer Area

- Based on discussions at the meeting, we understand that the Winding River Land Conservancy is working with Oak Reality to establish a bargain sale for one of several properties abutting Pequot Pond. The scope should specify the amount of funding allocated towards this task, and identify all other funding sources that will be pursued.
- Task 4b is a demonstration project. Based on discussions at the meeting, we understand that the project will develop a lake-friendly landscaping demonstration on the parcel purchased with grant money.
- The scope should specify who will be responsible for developing and maintaining the demonstration landscaping, and should provide a cost estimate.

Task 5 Invasive Aquatic Weed Control

- The scope should specify that the report and deliverables on herbicide treatment will include, at a minimum, pre- and post-application plant surveys including mapping, species lists and distribution, and photo documentation.

Task 6 Outreach and Education to Watershed Stakeholders

- Per DEM's request, a modified scope, budget and deliverables were submitted by the Pioneer Valley Planning Commission for this task. The modified scope is acceptable, but should include language on long term maintenance of the demonstration site (i.e., either identify who will be responsible for long-term maintenance, or specify how this responsibility will be determined during the project period.
- Task 6-B should specify the number of public events at which a booth/table will be set up.

Task 7 Install Education Signage

- Per DEM's request, a modified scope, budget and deliverables were submitted by the Pioneer Valley Planning Commission for this task.
- Final scope should specify budget for task 7, and if funds will be reallocated, identify to which task.

Task 9 Administration and Final Report

- Specify that Final Reporting will include five hard copies *and five copies of the final report on CD* to DEM, suitable for copying.
- At a minimum, DEM requires Quarterly Reports of both financial and project milestones.

CONTRACT

Your contract will include the following documents. Electronic copies of each will be emailed, and hard copies will be mailed.

- Commonwealth of Massachusetts Standard Contract Form and Instructions
- Contractor Authorized Signature Verification Form
- Affirmative Action Plan Form
- Scope of Work and Additional Terms and Conditions (to be completed upon receipt of scope)

REPORTING FORMS

- DEM will provide a standard reporting form that should be submitted with invoices on a monthly or quarterly basis.

- Invoices may be submitted in letter form, or using a Payment Voucher.
An electronic copy of the reporting form will be emailed. Hard copies of the reporting form and Payment Voucher will be mailed.

INSTRUCTIONS FOR COMPLETING FORMS

- Please use *blue* pen when signing and dating all sections of the contract and other enclosed forms. We will send you a copy of the contract after it has been signed by Commissioner Webber.
- For contracts of \$50,000 or more the Commonwealth requires that the person signing the contract be authorized to do so for the entity receiving funds for this project. Please have the authorized person sign the contract and other attached forms.
- Please have the authorized person print and sign the Contractor Authorized Signature Verification Form (CASV) and have the Town Clerk complete the form under the “CORPORATE CLERK” section.
- Instructions for completing the Commonwealth of Massachusetts Standard Contract Form are included with the form. Please note that the municipality (i.e., the contractor) must complete only those sections preceded by an “→”. I have already filled in some of the required information on your behalf.
- To receive funding the Town/City must send an invoice or letter requesting that the funds be provided by DEM in accordance with the grant award for the amount specified in the contract. We will provide you with a sample letter.
- The eligible project period for your funding will begin 10 days from the Department’s receipt of your signed contract. This is the earliest date that you may begin incurring expenses to be paid for via this contract.

Please return all correspondence to:

Anne Monnelly
Department of Environmental Management
251 Causeway Street, Suite 700
Boston, MA 02114-2104

If you have any questions, contact Anne Monnelly at 617-626-1395. If possible, the additional information requested in this email should be submitted on or before January 10, 2001. Once received, we will make every effort to move your contract through our offices as quickly as possible.

**Pequot Pond Watershed Restoration Project
Advisory Committee Meeting Minutes
January 24, 2002**

Attendance:

Nancy Pasquini, Hampton Ponds Association
Michael Parker, Watershed Initiative
Ken Taylor, Westfield Conservation Commission
Peter Legare, Westfield DPW
Joe Pescitelli, Westfield Community Development
Mark Cressotti, Westfield DPW
Mason Maron, Westfield River Watershed Association
Charles Darling, Westfield Water Department
Anne Capra, PVPC
Chris Curtis, PVPC

To begin the meeting, everyone in attendance introduced themselves and their affiliation to the project. Joe Pescitelli provided some background to past projects and planning efforts conducted both in-lake and in the Pequot Pond watershed. Chris Curtis discussed the purpose of the project and the role of the Advisory Committee in guiding the project.

Anne Monnelly, DEM Lake and Pond Initiative Manager, submitted comments to Joe about the proposed scope of work and requested additional information. The Committee discussed the comments by task.

Task 1 Roadway Drainage

DEM is concerned that the proposed solution to the roadway drainage problem may not be in-line with the type of innovative stormwater BMPs that the Department would fund under this program. DEM would like for the communities to look at a more innovative solution to the drainage problem, specifically by looking at the upstream reaches of the intermittent stream. DEM would prefer to see a watershed approach to controlling stormwater and stream flows upstream, before Birch Road, instead of piping the stream once it reaches the road. Joe and Mark will contact Anne Monnelly to discuss options and possibly schedule a site visit.

The Committee was unable to discuss the proposed work in Southampton because the Southampton DPW was not present.

The Cottage Road project is estimated to cost between \$70,000 - \$100,000. The proposed Birch Road project is estimated to cost \$222,000. This exceeds the \$262,500 proposed budget allowance for this task.

Task 2 Water Quality Monitoring

Nancy Pasquini provided the names of several residents of the Hampton Ponds areas that are interested in performing monitoring. PVPC will contact the volunteers to arrange training. Ken Taylor is also interested in volunteering. PVPC will work with DEM to develop standard operating procedures (SOP).

Task 3 Advisory Committee Meetings

Tracey Miller at DEP and Tom Lavoie at DEM were identified as possible candidates for the Advisory Committee. Joe will contact them.

Task 4 Land Acquisition

The Committee was unable to discuss this task due to the absence of Mark Noonan.

Task 5 Aquatic Weed Control

The City of Westfield will discuss further with the consultant Lycott about how to better document the process.

Task 6 Outreach and Education

PVPC will get parcel maps from Southampton and Westfield identifying publicly owned land. PVPC will work with the USDA Animal Damage Control Officer to design a goose control demonstration site on public property. PVPC will also contact McLoud and Monihan Associates to discuss coordination of the outreach components in this project and the DEP Pequot Pond project.

Task 7 Signage

If possible, Joe would like to reallocate some of the funding for signage to Task 1.

Task 8 Erosion and Sediment Control Bylaws

A subcommittee will be formed to focus on this task. Mason Maron volunteered. Other potential candidates include Larry Smith and Hank Barton. Northampton drafted a similar bylaw. PVPC will contact the Northampton Planning Department.

**Pequot Pond Watershed Restoration Project
Advisory Committee Meeting Minutes
May 30, 2002**

Attendance:

Nancy Pasquini, Hampton Ponds Association
Michael Parker, Watershed Initiative
Joe Pescitelli, Westfield Community Development
Mason Maron, Westfield River Watershed Association
Charles Darling, Westfield Water Department
Dick Hartwell, Westfield Conservation Commission
Anne Monnelly, DEM
Mark Noonan, Winding River
Anne Capra, PVPC
Chris Curtis, PVPC

1. Update on Status of State Contract and Scope

Anne Monnelly ran through the changes in the amended scope and commented on the status of specific tasks.

Task 1: Final approval by DEM on the storm water infrastructure improvements under Task 1 cannot occur until DEM reviews engineering calculations and preliminary design plans from the Westfield Engineering Department and the Southampton DPW. The Westfield Engineering Department needs to communicate further with DEM about why Westfield wants to pave Birch Road. DEM has not made a final decision as to whether they will support paving. Also at issue is whether the paving will be paid by the City of Westfield or will be funded by DEM under this project. These issues could only be raised and not answered since there was no representation from the Westfield Engineering Department at the meeting. The Westfield Engineering Department needs to call Anne Monnelly to discuss these issues. The Southampton DPW also needs to present flow calculations and a preliminary design plan for Cottage Road to DEM as soon as possible.

Task 2: DEM is still considering whether flow needs to be monitored for or not. They would like *E. coli* to include in the analysis. PVPC is currently drafting the QAPP. QAPP will be approved by DEM, not DEP.

Task 3: No changes.

Task 4: Winding River will seek additional funding sources for the land acquisition component.

Task 5: The consultant RFR should include pre- and post-treatment aquatic vegetation monitoring and a Vegetation Management Plan. DEM is willing to train the Hampton Ponds Association in aquatic weed monitoring through their Weed Watcher Program. Nancy felt the organization would be very receptive to this. DEM would like to see the reports from Lycott regarding the past treatment regiments.

Task 6: DEM is leaning toward Option 2 – Direct Outreach to Landowners. This is fine with PVPC. Mark Noonan is willing to assist with contacting landowners.

Task 7: DEM will provide “Stop the Spread of Invasives” signs for free. Cost of signage for goose control demonstration site is included under this task. Money can be shifted around within the various education tasks for the educational objectives and final products.

Task 8: A sub-committee of the Advisory Committee is needed to help develop the storm water bylaws. Joe will look into the Thursday morning Westfield department heads meeting as a possible group for this task. Southampton is already developing these bylaws under a separate grant with PVPC.

2. Training for Volunteer Water Quality Monitoring

Anne Capra is currently writing the QAPP and anticipates submitting it to DEM for review within 2 weeks. DEM would like to schedule the volunteer training for after July 4th. Anne Capra will contact the volunteers to check with volunteer availability. Water quality analysis will occur at Severn Trent Labs in Westfield and Berkshire Enviro Labs in Lee. Free analysis is available at the Berkshire Lab through LAPA-West. This assistance will be necessary to include the *E.coli* monitoring.

3. Update on Land Acquisition Candidates

Mark Noonan anticipates focusing on property owned by Oak Realty. Nancy Pasquini strongly recommended pursuing the property known as Free Beach, on the corner of Long Pond road and old Apremont Way in Westfield (parcels 276-4 and 272-1). This land, owned by Oak Realty, has one house on it that has applied to hook into the municipal sewer. The property has been the site of drownings and dumping in the past.

4. Identify Potential Sites for Geese Control Demonstration

Publicly owned land is most preferable for siting a goose control demonstration site that consists of both fencing and vegetation. PVPC will investigate the feasibility of installing the demonstration site somewhere along the shoreline of the DEM owned Pequot Pond State Park. The Park staff have installed a goose fence across most of the sandy beach front at the Park. It is unclear how this fence will be managed in the summer for swimming. So far, the fence is keeping geese off the beach. PVPC will contact Larry Tori to get more details about the fencing and the possibility of installing a permanent control site somewhere.

Next Meeting Date Thursday, July 11 @ 11AM
 Westfield City Hall
 Room 206

**Pequot Pond Watershed Restoration Project
Advisory Committee Meeting Minutes
September 10, 2002**

Attendance:

Nancy Pasquini, Hampton Ponds Association
Anna Weiser, Hampton Ponds Association
Michael Parker, Watershed Initiative
Ed Cauley, Southampton Highway Department
Thomas Gentile, Southampton Conservation Commission
Joe Pescitelli, Westfield Community Development
Mark Cressoti, Westfield Engineering Department
Mason Maronn, Westfield River Watershed Association
Charles Darling, Westfield Water Department
Michael Vedioveli, Westfield Community Development
Dick Hartwell, Westfield Conservation Commission
Richard Brazeau, DEM
Anne Monnelly, DEM
Mark Noonan, Winding River
Robin Simmen, PVPC

Preliminary Design Presentation for Birch Road and Cottage Avenue

Ed Cauley presented preliminary design plans for two BMPs on Cottage Avenue in Southampton to remove sediment. These 4' sumps and leaching basins can cope with 25-year storm events and will require maintenance once a year. The funding for them was reduced from \$106,000 to \$60,000, so the Cape Cod berms originally intended as part of the design were eliminated at the request of the Conservation Commission, which felt that channeling stormwater along the berms would disrupt its natural filtration.

Mark Cresotti presented preliminary design plans for installing a gravel, open-air swale along Birch Road in Westfield to leach as much water as possible into the ground before it runs through an oil separator and pipes to an outfall close to the wetland. The outfall will be put as close to the road as possible to avoid dumping water directly into the wetland. No water storage occurs along the way. Paving the gravel road is a possibility to a width of 18-22 feet.

The committee agreed to investigate establishing an open-air grassy swale between a private road on private property, which would leach water coming down onto Birch Road from Southampton. The Conservation Commission will support this effort with enforcement orders if necessary.

A public information meeting for Birch Road residents is needed to discuss these improvements, the issue of enforcement, and the possibility of extending the sewer system. Currently, there is no ward councilor for that area. Anne Monnelly and Robin Simmen will help Mark Cresotti coordinate this meeting.

Update on Land Acquisition Parcel Candidates and Funding Opportunities

Mark Noonan is having O'Connor realty do a restricted appraisal on several parcels owned by Oak Realty. Nancy Pasquini has strongly recommended pursuing the property known as Free Beach, on the corner of Long Pond road and old Apremont Way in Westfield (parcels 276-4 and 272-1). This land, owned by Oak Realty, has one house on it that has applied to hook into the municipal sewer, and Oak Realty wants to extend the sewer in order to build on the other property, so now is the time to acquire it for conservation. Terry Blunt was interested in it in the

past, and possibly the City Parks Dept is looking into it now. Mark has met with Oak Realty and received the committee's approval to go ahead with the appraisal process.

Status of Water Quality Monitoring

Arthur Screpitos at EPA is reviewing the QAPP submitted by A. Capra to A. Monnelly. Because the QAPP is not yet approved, no sampling has been done yet. An account has been set up with Berkshire Enviro-Labs in Lee, and we have their data sheets. Because construction of the BMPs will probably begin the second week of next March, sampling should be done this fall. Anne Monnelly will work with Robin Simmen to get this underway with the volunteers.

Update on Potential Sites for Geese Control Demonstration

Publicly owned land is most preferable for siting a goose control demonstration site that consists of both fencing and vegetation. PVPC will investigate the feasibility of installing the demonstration site somewhere along the shoreline of the DEM-owned Pequot Pond State Park. The Park staff has installed a goose fence across most of the sandy beachfront at the Park. It is unclear how this fence will be managed in the summer for swimming. So far, the fence is keeping geese off the beach. The criteria for a good demonstration site are:

1. The site be a place where geese currently congregate
2. The site should have high public visibility
3. The site must have an owner willing to let us use it to demonstrate goose control

To date, there are four options on the table for locating a demonstration site:

1. Larry Torri, the Director of the Hampton Ponds State Park, doesn't think park property is suitable for the goose demonstration project because any permanent planting there is likely to be trampled by people. He recommended investigating land across the pond owned by the DEM and the Div. of Fish and Wildlife.
2. We are in the process of finding out who oversees management of these state properties. Parcel #12 seems to be the best candidate with its stretch of sandy shoreline. Anne Capra observed geese in the cove above the property and was told by a landowner on Bass Cove Road that geese nest in the swamp below the parcel each year. One of the disadvantages to this site is that the public cannot access it from the road. Parcel #12 is fenced along the perimeter and posted with no trespassing. Anne was told that boaters stop at the beach and picnic from the pond; however, if the beach were planted, people probably wouldn't stop there anymore, all of which makes it less desirable as a demonstration site.
3. Another option is to contact the many private landowners who have problems with geese on their shorefront properties. We might be able to find a willing landowner through the Hampton Ponds Association. Nancy Pasquini could look into this. The downside to this option is that site would not be directly open to the public, but it would still be visible from the pond.
4. The committee agreed that the best option would be to put the goose demonstration site on land to be acquired by Mark Noonan, hopefully Free Beach.

Status of Invasive Aquatic Weed Control

Joe Pescatelli distributed a RFP to develop and implement a lake management and weed control program, and asked the committee for feedback. Nancy Pasquini brought in three specimens of weeds collected from the pond. Anne Monnelly identified two of them as being non-invasive native plants, but the third was Eurasian water milfoil, an invasive exotic that should be eradicated as quickly as possible. There are harvesting boats for this purpose in Southwick.

Next Meeting Date Tuesday, November 19, 1:00 pm
Westfield City Hall
Room 206

**Pequot Pond Watershed Restoration Project
Advisory Committee Meeting Minutes
November 19, 2002**

Attendance:

Nancy Pasquini, Hampton Ponds Association
Charles Darling, Westfield Water Department
Michael Vediovelli, Westfield Community Development
Dick Hartwell, Westfield Conservation Commission
Ken Taylor, Westfield Conservation Commission
Richard Brazeau, DEM
Anne Monnelly, DEM
Mike Gildesgame, DEM
Tracey Miller, DEP
Mark Noonan, Winding River
Anne Capra, PVPC

Birch Road Cottage Avenue BMP Updates

Anne Monnelly notified the Advisory Committee that the funding for the BMP design and construction on Birch Road and Cottage Avenues has been re-directed to Task 4 Land Acquisition. This order was handed down from the Executive Office of Environmental Affairs (EOEA) for the following reasons:

1. Task 1 as proposed does not meet grant eligibility requirements:
 - Does not demonstrate innovative approach or technologies;
 - Is not supported by sufficient data; and,
 - Budget is poorly documented.
2. There is insufficient assessment data to support the proposed roadway work:
 - No water quality data;
 - No data on runoff event frequencies;
 - No documented knowledge of impacts to Pequot Pond from roadway runoff.
3. The demonstration component of the grant is land protection/acquisition. Increased funding to this task will emphasize and improve chances for success of this effort.

QAPP and Water Quality Monitoring

With the removal of the Birch Road and Cottage Avenue BMPs from the project, the need for water quality monitoring in this subwatershed is questionable. DEM has offered to allow for the continuation of monitoring at the selected sites, if it would provide useful information, such as, helping the communities become eligible for a s.319 grant. This question will be posed to Ed Cauley and Mark Cressotti. If Westfield and Southampton are not interested in continuing the monitoring, the QAPP, written by PVPC and submitted to DEP and DEM, is no longer valid. Anne Capra will contact Mark and Ed to see what their level of interest is in pursuing the monitoring. Based on their responses, a decision will be made by DEM on how to restructure this task.

Update on Land Acquisition Parcel Candidates and Funding Opportunities

Mark Noonan is working with O'Connor Appraisal to develop appraisals for properties in the Free Beach area and at the end of Cottage Ave and Birch Road. Mark will have appraisals by end of the week. DEM suggested a subcommittee meet to discuss the appraisals and prioritize parcels to pursue. It is likely that additional funding will be needed on top of the grant money. Mark is looking into the Aquifer Land Acquisition Program and Self-Help as possibilities. Criteria for

prioritizing parcels will include cost, public access, potential for BMP demonstration, and willingness of landowner to sell.

Goose Control Demonstration

According to Rich Brazeau, DEM owns land in Lamberts Cove that might be appropriate for a goose control demo site. PVPC will schedule a site visit with Rich to explore these possibilities. Once land is chosen for the acquisition task, the potential for goose control measures will be explored there as well.

Aquatic Weed Control Program

DEM is planning to conduct a weed watcher training session with volunteers organized by Nancy Pasquini. The training will involve techniques for pulling weeds by hand, plant identification, and monitoring techniques.

Regarding the RFR for the aquatic weed management program, DEM would like to see more detailed language describing the required pre- and post-treatment monitoring. DEP encourages the city to reconsider whether chemical treatment of the pond is necessary at this time. Mike Videvelli will re-craft the RFR to require only an aquatic plant management plan, eliminating the chemical treatment at this time. If warranted during the life of the grant, chemical treatment can occur with some funding that will be set aside.

Stormwater Bylaws

Chris Curtis has been working with a group of department heads from the City of Westfield to draft two stormwater control bylaws. The Illicit Discharge Detection and Elimination Bylaw has been completed and will be brought before City Council for approval and adoption. The Erosion Control and Sedimentation Bylaw is close to completion. Chris will be meeting with the bylaw subcommittee to finalize this bylaw in January. PVPC has completed these bylaws for Southampton under a separate grant.

Next Meeting:

Tuesday, January 21, 2003 @ 1PM

Westfield City Hall

**Pequot Pond Restoration Project
Advisory Committee Meeting Minutes
January 21, 2003**

Attendance:

Nancy Pasquini, Hampton Ponds Association
Michael Vidiorelli, Westfield Community Development
Ken Taylor, Westfield Conservation Commission
Dick Hartwell, Westfield Conservation Commission
Richard Brazeau, DEM
Ann Monnelly, DEM (via. conference call)
Christopher Curtis, PVPC
Matthew DelMonte, PVPC
Alex Peshcov, Union News
Alec MacLeod, self (DEP contractor)

QAPP and Water Quality Monitoring

Ed Cauley of Southampton has expressed interest in continued water quality monitoring in the sub watershed. The question will be posed to Mark Cressotti to see what is level of interest is. Ann Monnelly reported that DEP will not fund the existing project as proposed and the scope would need to be reconfigured to meet S. 319 standards. Ann will contact Tracy Miller at DEP for guidance on this (innovative approaches, etc). The committee supported sampling in order to produce a more comprehensive assessment of the pond (e.g. sampling for TSS).

Update on Land Acquisition Parcel Candidates and Funding Opportunities

Nancy Pasquini (in Mark Noonan's absence) relayed that Mr. Epstein is not currently interested in selling the Free Beach property and house. Mr. Epstein has a current tenant in the home with a 3-year lease. However, no lease documents could be verified. Home improvements are being conducted on the property. Mr. Epstein is asking \$195,000.00 for the 5 parcels excluding the free beach property. Mark Noonan has made an offer of \$140,000.00. The committee agreed that obtaining all parcels would be beneficial to the pond restoration. However, Free Beach should be given the highest priority. Chris Curtis suggested trying to acquire parcels contingent upon termination of the existing lease. The Westfield Conservation Commission previously approved a sewer tie-in for the property, but the work has yet to be completed. The home previously failed a Title-5 inspection, and Rich Brazeau will follow up with the Westfield Board of Health regarding conditions. Mark Noonan recommends a possible land restriction on Free Beach if the property cannot be acquired.

Status of Stormwater Bylaws in Westfield and Southampton

Chris Curtis reported that two model bylaws for Southampton have been completed. 1) Elicit connections to systems; 2) Post construction bylaw. The town has not yet decided if the bylaws will be town-wide or specific to the drainage area. Similar bylaws are in draft form for the city of Westfield. The bylaws in Westfield will be city-wide. The bylaws will be brought before the city council. DEM recommends that all bylaws be town-wide.

Update on Potential Sites for Goose Control

With the Free Beach area out of contention for the demonstration, the committee decided to focus on state-owned parcels. DEM will discuss potential sites and finalize locations for goose control demonstration(s). Parcels will most likely be in the Lamberts Cove/ beach area or other areas adjacent to the boat ramp. Ann Monnelly suggested rapid implementation to avoid jeopardizing funding. Rich will coordinate with PVPC when plans are available.

Status of Aquatic Weed Control Program

Nancy Pasquini reported that the program would commence after the ice thaws.

Public Outreach in Spring

Matthew DelMonte distributed a list of selected BMP fact sheets for comment and review by the committee. Rich Brazeau suggested adding a BMP fact sheet on pet waste. PVPC will work with the Hampton Ponds association to distribute the fact sheets as part of their quarterly newsletter and monthly dinners.

Other Business

Alec MacLeod, who is performing sampling at Pequod Pond under a DEP grant, will be conducting two phases of water quality sampling at the pond. Parameters will include E-coli bacteria, fecal coliform bacteria, and total phosphorous. Phase I will include both dry and wet weather sampling events. Phase II of his sampling will be based on the analytical results of the first event.

Next Meeting:

Tuesday March 11, 2003 at 1:00 P.M.
Westfield City Hall

Pequot Pond Restoration Project Advisory Committee Meeting Minutes March 11, 2003

Attendance:

Nancy Pasquini, Hampton Ponds Association
Michael Vidovelli, Westfield Community Development
Mark Cressotti, Westfield Engineering
Mark Noonan, Winding River Land Conservancy
Ken Taylor, Westfield Conservation Commission
Tom Gentile, Southampton Conservation Commission
Richard Brazeau, DEM Region 4
Anne Monnelly, DEM Lakes and Ponds
James Straub, DEM Lakes and Ponds
Anne Capra, PVPC
Matthew DelMonte, PVPC

QAPP and Water Quality Monitoring

Anne Monnelly reported that DEP will not fund the existing monitoring as proposed under § 319 and water quality monitoring will not continue under task 1. The existing QAPP was not approved and should be considered a learning experience. Continued monitoring would need to be funded under a separate grant.

Update on Land Acquisition Parcel Candidates and Funding Opportunities

Mark Noonan relayed that Mr. Epstein is still not interested in selling the Free Beach property with the house because he has a current tenant in the home that has an option to purchase the property. The current property appraisals are being revised to take into account the new zoning bylaw requiring a minimum 2-acre lot for new developments above the Barnes Aquifer. This new ordinance in Westfield should make the properties less valuable to Mr. Epstein. Mark Noonan is still negotiating with Mr. Epstein to purchase other properties and a potential conservation restriction on the Free Beach parcel.

Nancy Pasquini has filed a formal complaint with the Westfield Health Department for continued use of the home after a failed Title-5 inspection. The Westfield Health department is reluctant to act due to existing plans to connect the property to the municipal sewer system.

Status of Stormwater Bylaws in Westfield and Southampton

Anne Capra reported that two model bylaws for Southampton have been approved by the Planning Board 1) Illicit Discharge Detection and Elimination, and 2) Erosion and Sediment Control. The bylaws will now be brought before the town for approval. The Westfield round table committee is reviewing similar bylaws for Westfield. DEM recommends that all committee concerns and process obstacles be documented and reported.

Update on Potential Sites for Goose Control

Anne Capra and Matthew DelMonte of PVPC met with Anne Monnelly and James Straub at Pequot Pond to finalize a location for the goose demonstration site. A parcel located southwest of the Hampton Pond State Park beach was chosen for the demonstration. This parcel is a common gathering point for the geese and is highly visible. The demonstration site will serve as a “lake-friendly” landscaping model for homeowners around Pequot Pond and will serve as a model to be replicated at other Lakes and Ponds in the Commonwealth. PVPC will send preliminary plans to Tom Lavoie as well as the park staff for review. PVPC will complete a Request For Determination of Applicability to be filed with the Westfield Conservation Commission after DEM and staff review.

Status of Aquatic Weed Control Program

Tom Gentile gave a brief synopsis of aquatic weed control and distributed fact sheets from a recent seminar he attended. DEM questioned the need for an herbicide treatment and suggested that funding would be better spent on a Pond Management Plan instead. Mike Vidovelli will ask if the City of Westfield supports such a management plan.

James Straub relayed that new draft standard operation procedures for pond weed control (benthic barriers and pulling) are available in draft form. The new SOPs could be used immediately by pond residents and volunteers to control invasive aquatic plants.

Public Outreach in Spring

A list of available public outreach materials and fact sheets was included in the recent Hampton Ponds Association newsletter distributed to over 1,500 watershed residents and property owners. The newsletter encouraged Pequot Pond residents to contact PVPC for technical assistance.

Anne Monnelly reported that a new DEM Lake Brochure is complete; however, DEM does not have funding to print and distribute the brochure. PVPC will check the outreach budget to see if funding is available for printing. Anne M. will forward a template to PVPC to make the brochure more specific to Pequot Pond.

Signage needs to be developed for the goose demonstration site and existing “stop the spread of invasives” signs should be posted at the boat ramp.

Other Business

Alec MacLeod and Nancy Pasquini have applied for a Five-Star Restoration Challenge grant to conduct a shoreline restoration along the boat ramp area of Pequot Pond.

**Pequot Pond Restoration Project
Advisory Committee Meeting Minutes
October 23, 2003**

Attendance:

Nancy Pasquini, Hampton Ponds Association
Alec MacLeod, Consultant
Michael Vidovelli, Westfield Community Development
Mark Noonan, Winding River Land Conservancy
Ken Taylor, Westfield Conservation Commission
Dick Hartwell, Westfield Conservation Commission
Tom Gentile, Southampton Conservation Commission
Anne Monnelly, DEM Lakes and Ponds
Anne Capra, PVPC
Matthew DelMonte, PVPC

Update on Land Acquisition Parcel Candidates and Funding Opportunities

Mark Noonan relayed that he expects to close on the Free Beach Property the first week in November. He is uncertain whether \$45,000 of bond money will be available from the state but expects to raise the money through alternate means if reallocated.

Free Beach Shoreline Restoration Update

Alec MacLeod reported that the National Fish and Wildlife Foundation grant money has yet to be released. He expects to begin site survey, design, and permitting over the winter.

Review of Goose Control Demonstration Sign

Anne Capra relayed that the goose control demonstration site sign has been edited and finalized. She will forward a copy of the sign to Anne Monnelly.

Review Landscape Audit Results

Anne Capra reported that PVPC staff members completed two landscape audits on Pequot Pond. The first audit was completed at the island site. This location was generally in a good natural state although severe erosion had occurred along the north and northeast banks due to boat wake. The property was in need of structural BMPs to remediate the conditions. Anne did offer the property owner willow tublings in an attempt to stabilize portions of the shoreline; however, the owner declined the offer. Additional plants may be offered in the spring.

The second property was located on a peninsula in Southampton. This property was actively cared for and had experienced minimal erosion on the western portion of the property. The property owner was managing a small crop of invasives and had developed a vegetated buffer on much of the property. Anne will order and deliver additional plants to the owner to further develop the buffer.

Anne Monnelly suggested that PVPC conduct two more landscape audits on "unfriendly" lake properties. Nancy Pasquini will solicit landowners for volunteers.

Other Business

Anne Capra presented a display that was prepared for a lake restoration project in Southwick and asked if there was interest for such a display for this project. Anne Monnelly thought that more active outreach should be used as part of this project; however, Tom Gentile was interested in a similar table-top display for use in Southampton.

B: VEMN Manual

PEQUOT POND RESTORATION PROJECT



VOLUNTEER ENVIRONMENTAL MONITORING NETWORK (VEMN)

FIELD WATER SAMPLING MANUAL FOR VOLUNTEERS

Pequot Pond Stormwater Monitoring 2002
Birch Road/Cottage Avenue

*“The objective of the Act is to **restore** and **maintain** the chemical, physical, and biological integrity of the Nation’s waters.”*
(Federal Clean Water Act, 1972).

Pequot Pond Stormwater Monitoring 2002

PROJECT COORDINATOR: Anne Capra, Pioneer Valley Planning Commission
(413) 781-6045

SAMPLING SITES: Birch Road, Westfield
Cottage Avenue, Southampton

SAMPLING DATES: TBA

The Project Coordinator will advise volunteers as to upcoming storm events for wet weather sampling.

Sample Drop Off Locations:

Berkshire Enviro Lab, Inc.
266 Main Street
Lee, MA 01238
(413) 243-1416; Hours 9 am – 5 pm

Directions: Take Mass Pike west to Exit 2. Take Route 20 west at end of exit ramp (this is also Housatonic Street). Follow Route 20 west – it will turn into Park Street and then Main Street and zig zag through town. Berkshire Enviro Lab is a 3-story brick building on the right at the end of Main Street. (Joe's Diner will be directly in front of you when the lab is on the right. A convenience store is across the street from the lab.)

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Pocket Contents: Chain of Custody Sheets
Sample Bottle Label
Field Data Sheets

About This Manual

Thank you for volunteering to help with this project! This effort would not be possible without you. These pages are meant to help you collect samples for water quality assessment. They give you some background on the project, detailed instructions for collecting water samples, an explanation of the water quality indicators we will be measuring for this project, and field sheets. Please try to review this package before your first sampling date.

If you have questions regarding the sampling schedule or sites, or if conflicts arise and you cannot collect on a date you volunteered for, or if you would like to pass along information, the coordinator for this project is:

Anne Capra
Pioneer Valley Planning Commission
26 Central Street
West Springfield, MA 01089
(413) 781-6045

I. Your Work As A Volunteer

This project would not be possible without the contributions of people like you. We want you to know that we deeply appreciate your time, effort, and commitment to this project. The success of the water sampling ultimately depends on you! Please help us by doing the following:

- 1) Please try to collect your samples on the dates you agreed. If for some reason you cannot do it, let the project coordinator know.
- 2) Please follow the sampling instructions carefully. They have been designed this way to assure quality control.
- 3) Please try to collect your samples early and get your samples to the drop off point quickly. The quality of the sample depends on timely delivery to the lab.
- 4) Please review the following instructions carefully, before your first sampling. If you have questions, contact the project coordinator.

II. A Brief Look At What Happens On A Sampling Date

You have volunteered to collect water samples on the sampling dates to be identified with the project coordinator. On each of these dates, you will visit each of the sites you signed up for, fill out a field sheet with sampling information and field observations, collect water samples in various containers, and fill out a chain of custody sheet for the samples. After you collect the samples, place them in a cooler on ice and bring them to the drop off point or lab, as assigned.

A PVPC staff person will be going out with volunteers on a rotating basis to collect quality control duplicate samples.

Drop-Off Point

Samples should be delivered to Berkshire Enviro Lab in Lee by 3 PM. If you anticipate a problem with delivering the samples, call the project coordinator.

III. What To Do On A Sample Collection Day

Preparation

- 1) **Pick up Sample Containers and Reagents:** If you do not already have sample containers, make arrangements with the project coordinator before the sampling date. Otherwise, pick up your sample containers for the next sampling date each time you drop off your water samples.
- 2) **Pack a cooler with ice** to keep your samples cool. Place the thermometer in the cooler to confirm that samples are maintained at 4 degrees Celsius.

Checklist for Sample Sites

For all sites:

- ___ Cooler with ice
- ___ Chain of Custody sheets
- ___ Field Sheet
- ___ Clipboard and Pencil
- ___ A water proof marker, ball point pen

___ For **Turbidity**, 1000 mL plastic screw-cap bottle (will be provided by the lab).

___ For **Total Suspended Solids** (TSS), same bottle as Turbidity

___ For **Total Phosphorus** (TP), same bottle as Turbidity

What To Do At The Site

- 1) **Record observations of field conditions on your field sheet.** For each record note your name, the date, site number(s), and time. Also record:
 - Current weather: sunny, cloudy, rain etc. Also wind conditions.
 - Note whether or not it rained within the last 24 hours
 - Water color and odor
 - 3 Flow measurements
 - Any other observations or comments, such as recreational activity, trash, etc. and anything out of the ordinary.
- 2) Collect water samples following the instructions below.
- 3) Collect flow measurements following the instructions below.
- 4) Repeat all steps for each site and return the samples, field and custody sheets to the appropriate drop-off point. You will need to sign off on the custody sheet each time samples are transferred to a different person. **When necessary, pick up new sample bottles for the next collection date at the drop-off.**

How To Collect Water Samples

In General: Sample away from the bank in the main current, at the deepest point. In any case, avoid sampling stagnant water! In shallow areas, wade into the water carefully to collect the sample.

Wash your hands before starting your sample run. ☺ Be careful not to touch your hands to yourself after you have cleaned them in order to avoid coming into contact with possible pathogens.

IMPORTANT: Respect the sterile conditions of these sampling procedures. This means: 1) never touch the inside of the lid, rim or inside of the container; 2) never use an eye dropper or any other object to adjust the sample level in your container. It is better to overfill and pour off excess, than it is to underfill and have to repeat steps.

One sample bottle will be used to collect a samples for Turbidity, Total Phosphorus (TP), and Total Suspended Solids (TSS). The bottle will be acid-rinsed.

Note: Be sure to take the sample in the middle of the water column, rather than near the top or the bottom.

1. **Carefully wade into the stream.** Stand so that you are facing one of the banks.
2. **Do not rinse the sample bottle with site water.** It has been acid-rinsed at the lab and no additional rinsing is necessary.
3. Take the sample. To take the sample, remove the bottle cap and turn the bottle upside down, plunge into the water to _ depth. When at desired depth, turn bottle right side up to fill. **Be sure not to stir up any of the sediment while taking the sample.**
4. Cap securely and store the sample in the cooler. Samples should be stored at 4 degrees Celsius for transport.
5. Site BR2 is an end-of-pipe sample. Uncap the bottle and place it below the pipe in the line of the main flow from the pipe. Be careful not to touch the pipe with the lip of the bottle.

PLEASE MAKE SURE THAT FIELD SHEET AND CHAIN OF CUSTODY FORMS ARE COMPLETELY FILLED OUT.

How To Collect Flow Measurements

From CN 68.0 Flow Measurement SOP, Division of Watershed Management, DEP

8.3 Pipe Flow at Outfalls

8.3.1 Pipe Flow at Outfalls Using Timed Volumetric Discharge

This method uses the time required to fill a container to capacity (or to a measured volume) to calculate discharge. In practice, it is generally limited to small discharges (where all the flow can be captured in one bucket/container and for a time period of at least 15 seconds). Using a stopwatch to time the filling period, a large container of known volume is placed below a non-jetting discharge, in such a way to capture all the water. This is repeated three times for an average time (T) and average volume (V). Convert container volume to cubic feet (1 gallon= 0.1337 cubic foot; 1 liter= 0.0353 cubic foot), V, and calculate discharge in cfs as: $Q = V/T$.

Example: *A 2 inch diameter, sloped pipe with foul water emanating from it is found discharging into a stream. There is sufficient space under the pipe outfall to place a 5 gallon volumetric (marked in quarts) to collect the discharge. The times and volumes collected are: 5.0 gallons in 16 seconds, 5.0 gal/14.5 sec. (OK) and 5.0 gal/17.5 sec. Therefore, $Q = (5.0)(.1337)/16$ or 0.042 cfs.*

Sample Forms

Chain of Custody Form

Name of Lab. -

Client: _____ Samplers: _____

Signature: _____

Sample ID	Station Location	Date, Time	Type	#Bottles	Analyses	Comments
Relinquished by: Signature			Received by: Signature			Date/Time
Relinquished by: Signature			Received by: Signature			Date/Time
Relinquished by: Signature			Received by: Signature			Date/Time
Relinquished by: Signature			Received @Lab: Signature			Date/Time

Comments:

Sample Bottle Label

Site Location _____
Site No. _____
Sample Type: _____
Date: _____ month/ day / year
Time: _____ am / pm
Preservation Method: _____
Sampler's Name _____

**Pequot Pond Stormwater Monitoring 2002
Volunteer Monitoring Program**

FIELD DATA SHEET

Date: _____ Primary Sampler: _____

Site Number: _____ Additional Samplers: _____

Time: _____ AM / PM

Weather Conditions

Sky: clear cloudy partly cloudy _____

Wind: _____ Air Temp: (C / F) _____

Weather conditions during the prior 72 hours: _____

Flow Measurements

Number Volume (gallons) Time (seconds)

<u>1</u>	_____	_____
<u>2</u>	_____	_____
<u>3</u>	_____	_____

Remember: Use ink pen only. Cross out (do not erase) and correct errors. Initial any corrections made.

C: Draft QAPP

QUALITY ASSURANCE PROJECT PLAN

For

Pequot Pond Demonstration Restoration Project

Massachusetts Department of Environmental Management

Prepared by Anne Capra

Massachusetts Department of Environmental Protection

Submitted: November 2002

PROJECT MANAGER

Christopher Curtis, Principal Planner
Pioneer Valley Planning Commission
26 Central Street, West Springfield, MA 01089-2787
chcurtis@pvmc.org
413-781-6045 FAX- 508-792-7718

DATE

PROJECT QUALITY ASSURANCE OFFICER

Anne Capra, Senior Planner
Pioneer Valley Planning Commission
26 Central Street, West Springfield, MA 01089-2787
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413-781-6045 FAX- 508-792-7718

DATE

MA AGENCY PROJECT MANAGER

Anne Monnelly, Lakes and Ponds Initiative Manager
DEM Office of Water Resources
251 Causeway Street, Boston MA 02114
anne.monnelly@state.ma.us
617-626-1395 FAX- 617-626-1349

DATE

EOEA WATERSHED TEAM LEADER

John O'Leary, Westfield Watershed Team Leader Hampton Ponds State Park, 1048 North Road, Westfield, MA 01085 John.Oleary-FEW@state.ma.us (413) 532-4450 FAX n/a	DATE
---	------

DEP REVIEWERS

Richard Chase, DEP, 627 Main Street, Worcester, MA 01608 (508) 767-2859	Arthur Screpetis, DEP (508) 767-2875 FAX- (508) 791-4131	DATE
---	---	------

VOLUNTEER TEAM LEADER

Nancy Pasquini Hampton Ponds Association, 975 Old Stage Road, Westfield, MA 01085 Email n/a Phone (413) 536-2305 FAX n/a	DATE
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3. Distribution List

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Mark Cressotti, City Engineer 59 Court Street Westfield, MA 01085	Ed Cauley, Superintendent Highway Department 8 East Street Southampton, MA 01073	Ken Taylor, Chair Conservation Commission 59 court Street Westfield, MA 01085
Mark Noonan Winding River Land Conservancy POBox 1836 Westfield, MA 01086	John O'Leary Hampton Ponds State Park 1048 North Road Westfield, MA 01085	Nancy Pasquini Hampton Ponds Association 975 Old Stage Road Westfield, MA 01085
Joe Pescitelli Community Development 59 Court Street Westfield, MA 01085	Tracey Mller DEP 436 Dwight Street Springfield, MA 01103	Arthur Screpitis DEP 627 Main Street, 2 nd Floor Worcester, MA 01608
Arthur Clark EPA 11 Technology Drive N. Chelmsford, MA 01863-2431	Bill Ensr Berkshire Enviro Lab 266 Main Street Lee, MA 01238	

4. Project/Task Organization

Table 4.1 Key Personnel

Title	Responsibility	Name	Address / Phone / email*
Responsible Agency	Fiscal management of the project, project objectives, data uses, program changes, etc.	Pioneer Valley Planning Commission	26 Central Street West Springfield, MA 01089 (413) 781-6045
Technical Advisory Committee	Primary assistance in identifying project objectives, data quality objectives and methods, and oversight of project assessment.	Rich Brazeau (DEM), Tracey Miller (DEP), Mike Parker (EOEA), Mike Gildesgame (DEM), Anne Monnelly (DEM), Mark Cressotti (Westfield), Peter Legare (Westfield), Ed Cauley (Southampton), Nancy Pasquini (HPA), Mark Noonan (WRLT), Mason Maron (WRWA), Chris Curtis (PVPC), Anne Capra (PVPC).	
Project Manager	Directs all project activities for the agency and oversees development and evaluation of the QAPP.	Christopher Curtis	26 Central Street West Springfield, MA 01089 (413) 781-6045
QA Officer/QAPP writer	Assists with or writes the QAPP and ensures that all elements of the project follow QA procedures in the QAPP.	Anne Capra	26 Central Street West Springfield, MA 01089 (413) 781-6045
Laboratory Director	Oversees or conducts all lab analyses and ensures that all QA procedures in the lab QAPP are followed.	Bill Ensr	BEL 266 Main Street Lee, MA 01238 (413) 243-1416
Monitoring Project Coordinator	Coordinates all elements of the field monitoring, provides training to volunteers and assesses field monitoring performance.	Anne Capra	26 Central Street West Springfield, MA 01089 (413) 781-6045
MADEP QA officer	Reviews the QAPP for accuracy and completeness.	Arthur Screpitis	DEP 627 Main Street, 2 nd Floor Worcester, MA 01608 (508) 767-2875

DEM Project Officer	Ensures that all agency reporting requirements are met	Anne Monnelly	DEM, Office of Water Resources 251 Causeway Street, Suite 700 Boston, MA 02114-2104 (617) 626-1395
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5. Problem Definition/Background

Pequot Pond is an important and highly utilized recreational resource for the City of Westfield, Town of Southamptton, and the City of Holyoke. The pond is located in the northeast corner of the City of Westfield and the southeast corner of the Town of Southamptton. The watershed area is 2.8 square miles, and extends northward into Southamptton and eastward into Holyoke. Pequot Pond, classified as a Class B waters (MA Surface Water Quality Standards, 1996), is part of the Hampton Ponds system and is a 303d listed water body for nutrients, noxious aquatic plants, and organic enrichment / low dissolved oxygen (MA 1998 303d Listing of Impaired Waters, 1999). This QAPP is being developed as part of a DEM Lakes and Pond Demonstration Grant awarded to the City of Westfield in November 2001. The goal of the project is to further efforts to remove Pequot Pond from the 303d list by reducing nutrient and sediment loading through implementing several structural and non-structural BMPs including education and outreach, structural BMPs for roadway runoff, purchasing land in the watershed, and building cooperation between all watershed stakeholders. This QAPP covers activities proposed under the Roadway Drainage Improvements task of the DEM project. Activities proposed for this task are described below in greater detail.

The Hampton Ponds are a series of glacial kettle ponds. These ponds were formed as ice blocks were buried in glacial melt-water material. As the ice melted, a depression was left that formed the pond's basin. The basin has a maximum depth of approximately 25 feet (Lycott, 1986). Pequot Pond has several small tributaries which, under normal rainfall conditions, flow into the pond: one from Long Pond on the western shore, one from the wetlands to the north of the pond, and one that flows into Pequot approximately halfway up the eastern shore. In addition, several intermittent streams drain into the pond. The outlet of the pond is located at the southern end and drains into Horse Pond, also 303d listed for noxious aquatic plants. The upland areas of the watershed are glacial tills of the Chalton-Paxton-Woodbridge Association. The soils in the immediate vicinity of the pond are stratified drifts deposited as glacial outwash.

The Department of Environmental Management's Hampton Ponds State Park and boat launching ramp, located at the south end of the pond along Route 202, are highly utilized recreational resources. The pond is used for swimming, boating, and fishing. Monitoring at the State Park swimming beach has indicated elevated levels of fecal coliform that resulted in beach closures during the summer of 2000. Possible sources of fecal coliform include failing septic systems around the pond, the growing goose population, pet waste from residential areas, and agricultural activities. A Diagnostic and Feasibility Study prepared in 1986 by Lycott Environmental Research, Inc. identified failing septic systems, siltation and nuisance vegetation as sources of impairment to the pond. Although this project will not directly address bacteria concerns, a concurrent study funded by DEP is investigating bacteria sources and recommending an action plan to address them.

Historically, the residences surrounding the pond were built as summer homes. Today, the watershed is dominated by year-round residential land use with some agricultural and commercial land use. Westfield and Southamptton have conducted several projects to control nutrient and sediment loading to the pond. Activities taken to date include:

- Installation of a vegetated swale on DEM property along Italian Club Road. DEM is purchasing and demolishing houses along the lakeshore. DEM has upgraded the septic systems at its facilities.
- The City of Westfield has received funding from DEM to apply herbicides for weed control for two years.
- Boards of Health from Westfield and Southamptton have conducted periodic septic tank inspections. Southamptton is involved in the CSMP program.
- A water protection/sediment control bylaw has been developed for Southamptton. The bylaw was narrowly defeated at Town Meeting. Planning Board is considering resubmitting at a future Town Meeting.
- Southamptton has a catch-basin clean-out schedule. They have installed 126 catch-basins to date (3 foot sumps with hoods) and inspect yearly. Southamptton also conducts routine street-sweeping.
- Westfield has a catch-basin clean-out schedule in the Pequot Pond area of town

To further efforts to minimize impacts of untreated roadway runoff on Pequot Pond, a series of structural BMPs are proposed under this DEM Lakes and Pond Demonstration Grant. The goal of the BMP improvements is to demonstrate the best available technology for treating residential road runoff to remove the maximum possible amount of phosphorus, and total suspended solids prior to discharge into the pond.

Preliminary designs indicate a series of vegetated swales along the eastern edge of Birch Road and a detention basin at the base of the road, before the pond. Southampton will install leaching catchbasins, a cape cod berm, and a grassed swale along Cottage Avenue. The purpose of the monitoring described in later sections of this QAPP is to evaluate the condition of stormwater in these two sub-watersheds before and after the installation of the BMPs. Specifically, are the BMPs reducing total suspended solids, total phosphorus, and turbidity in runoff to the pond.

6. Project/Task Description

Monitoring Locations

The BMPs on Cottage Avenue and Birch Road are being installed in a treatment chain. The sampling locations are being selected to provide both upstream and downstream data for the BMP treatment chain on each road. See attached map. Sampling will be conducted by volunteers trained by DEM using the Volunteer Environmental Monitoring Network's *Field Water Sampling Manual for Volunteers* as a guide. Samples will be collected as grab samples.

Table 6.1 Monitoring Locations

SITE	LOCATION
BR1	Above proposed Birch Road BMP - Southeast side of intersection of Birch Road and Long Pond Road; in intermittent stream, as water exits culvert; upstream location.
BR2	Below proposed Birch Road BMP - At drain pipe outfall; southeast of intersection of Birch Road and dirt cross street; downstream location.
CA1	Below proposed Cottage Ave BMP - At end of grassed swale before water enters pipe; Cottage Avenue upstream location

Sampling Schedule

Sampling for Total Suspended Solids, Total Phosphorus, Turbidity, and flow will occur concurrently at each sampling site. Volunteers will attempt to sample as close to the "first flush" as possible. First flush, and wet weather events will be defined as follows:

Storm Water Monitoring (Wet-Weather)

Literally, the first flush is the first runoff at a specific sample site after a period of dry weather

(defined for this project as a minimum of 72 consecutive hours with less than 0.10 inches of rain).

This sampling program will capture early flush, defined as within the first two hours of a significant precipitation event. A significant rain event will be one in which at least 0.25 inches of precipitation is predicted. Monitoring weather information to predict when significant rain events will occur is essential to forecasting sample times. The Project Manager will specify sample times according to meteorological forecasts. Samples will be collected at each of the sample locations in sample containers provided by BEL.

The frequency of sampling will be as follows:

Pre-Construction

1 wet weather event

Post-Construction

3 wet weather events

Table 6.2 QAPP Monitoring Timetable

Activity	Timeframe
Overall Project	Contract Expires June 30, 2004
QAPP Development and Approval	May-August 2002
Volunteer Training	July 2002
Pre-construction Monitoring	November 2002
Installation of BMPs	Spring - Summer 2003
Post-construction Monitoring	Fall 2003
Data Analysis	Winter 2003
Interim Reports	Quarterly
Final Report	Spring 2004

7. Data Quality Objectives (DQOs) for Measurement Data

A series of stormwater infrastructure improvements will be installed on Birch Road and Cottage Avenue to better manage runoff to the pond. The goal of the monitoring is to satisfactorily determine that the installed BMPs are controlling sediment loading, phosphorus loading, and peak flows to the pond. The goal of the data collection is to produce data of sufficient quality to be acceptable to the Technical Advisory Committee as described above and any other audiences that may use the data in the future. Table 7.1 includes a list of the parameters that will be monitored for and desired targets for precision, accuracy, measurement ranges for each. The DQOs were developed from guidance provided by the Massachusetts Waterwatch Partnership and Berkshire Enviro Lab. Field duplicates and blanks will be collected for 33% percent of all samples per event. Because there are only three sample sites, collection of a field blank and field duplicates for each parameter at one site per sampling event equals 33% of samples per event. A schedule for field duplicate and field blank collection is described under Section 10 Sampling Process Design.

The representativeness of the sampling for actually representing the stormwater water quality is high. Appropriate sites have been selected for upstream and downstream monitoring, directly in line of the flow of stormwater through the sub-watershed. Phosphorus, sediments, and bacteria were identified in the D/F as the primary sources of contamination to the pond and have been selected as the monitoring parameters.

The data collected within this study will be highly comparable for both pre- and post-construction activities and upstream and downstream conditions. The comparability of the data to other water quality studies in the watershed will be somewhat limited by the sampling locations.

The completeness of the sampling is expected to be high due to the relatively few number of sampling sites. For each sampling event, of which there are 6, 4 parameters will be sampled at 4 sites.

Table 7.1. Data Quality Objectives

Indicator	Units	Minimum Detection Limit	Accuracy/Bias ^{1,2}	Overall Precision ³	Approx. Potential Range
TP (water)	mg/l P	0.01	80-120% recovery for QC std. And lab fortified matrix	± 0.005 mg/l if less than 0.50 mg/l or 20% RPD if more than 0.050 mg/l	0.000-0.500
Turbidity	NTU	5	90-110% recovery of turbidity std.	± 5 NTU if less than 1 NTU or 20% RPD if more than 1 NTU	0-200
Total Suspended Solids, TSS	mg/l	1.0	75-125% recovery for QC std.	± 1.0 or 25% RPD whichever is higher	0.0-500
Flow	cfs	N/A	50-150%	35% RPD based on triplicate flow measurement	0 - 100

¹ Accuracy is determined by the analysis of spiked sample except as noted in the table. QC sample recoveries may also be used to assess accuracy when spiked sample analysis is not possible. The general DQO for all blanks is no exceedances of the MDL.

² For accuracy determination, spiked samples are preferred.

³ Overall precision is measured using the relative percent difference, RPD (or std. Deviation for $n > 2$) of field duplicate samples. Lab precision is based on an estimate of the RPD between duplicate aliquots of the same lab sample.

8. Training Requirements / Certification

Sampling will be conducted by trained volunteers, and PVPC staff if necessary. Anne Monnelly, DEM Lakes and Pond Initiative Manager, will conduct the field sampling training. Training will consist of: 1) a background presentation on the monitoring program and how the tasks that the volunteers will be trained to carry out fit into the overall program; 2) demonstration by the trainer of the task; 3) practice by the volunteers, closely watched by the trainer; 4) feedback on their performance at the training; 5) an overview of the sampling schedule; 6) a trip to the lab to demonstrate the sample delivery process; and 7) formal acknowledgement of successful completion of the training program. How to fill out sample labels and chain of custody forms will also be discussed at the training. Volunteers will be provided with a copy of the Volunteer Environmental Monitoring Network's *Field Water Sampling manual for Volunteers*, as amended for this project.

Table 8.1. Training Program Summary

Task and Type of Volunteer Training	Frequency of Training/Certification and By Whom
Field sampling	Annually, DEM
Water chemistry analysis	Annually, Berkshire Enviro Labs

Table 8.2. Training Records

Project Function	Training Course Title	Provided by	Training Date	Personnel Trained	Personnel Function	Training Record Location
General Water Quality Field Sampling	Water Quality Field Sampling	DEM	mid-July	Joe Giroux Chris Taylor Bobby Dame Fred Bergeron Ken Taylor Anne Capra	Field Collection Volunteers	Pequot Pond

9. Documentation and Records

Volunteers will be given the Field Water Sampling Manual for Volunteers that will provide detailed instructions on how to collect the water quality samples and how to fill out the Field Data Sheets that accompany the water samples and the sample label (see Attachment _). These forms will be completed on-site at the time of sampling. The volunteer monitors will label the samples in the field with the date, location, and site number. At a minimum, the field data sheets will record the date and time of sample collection, the name and number of the site, site location, type of sample container used, weather observations, name of collector(s), rainfall amount for that storm, comments, and a chain-of-custody sign –off for when transferring the samples to the lab. Field data sheets will be signed by samplers at the time of the sampling event. The volunteer responsible for the sampling, will transfer the samples to the lab or make arrangements with the Project Coordinator for someone else to deliver the samples tot he lab.

Records will be returned from the lab with the lab results to the Project Monitoring Coordinator. Records will be stored at PVPC for up to one year after the project has ended.

Table 9.1. Sample label

Site Location _____	
Site No. _____	Sample Type: _____
Date: _____	Time: _____ am
mm/dd/yr	
Preservation Method: _____	
Sampler's Name _____	

Table 9.2. Chain of Custody Form

Name of Lab.-

Client: _____ Samplers

Signature: _____

Sample ID	Station Location	Date, Time	Type	#Bottles	Analyses	Comments
Relinquished by:Signature			Received by: Signature			Date/Time
Relinquished by:Signature			Received by: Signature			Date/Time
Relinquished by:Signature			Received by: Signature			Date/Time
Relinquished by:Signature			Received @Lab: Signature			Date/Time

Comments:

Table 9.3 Field Data Sheet

FIELD DATA SHEET

Date: _____ Primary Sampler: _____

Site Number: _____ Additional Samplers: _____

Time: _____ AM / PM

Weather Conditions

Sky: clear cloudy partly cloudy _____

Wind: _____ Air Temp: (C / F) _____

Weather conditions during the prior 72 hours: _____

Flow Measurements

Number Volume (gallons) Time (seconds)

<u>1</u>	_____	_____
<u>2</u>	_____	_____
<u>3</u>	_____	_____

Remember: Use ink pen only. Cross out (do not erase) and correct errors. Initial any corrections made.

10. Sampling Process Design

The parameters that will be sampled for include total suspended solids (TSS), total phosphorus (TP), and turbidity. Flow measurements will be conducted concurrently at site BR2 only. Samples will be collected as grab samples collected in containers provided by the lab. Field blanks and field duplicates will be collected for 33% percent of all samples per event. Table 10.2 outlines the field blank and field duplicate collection schedule. Field blank will consist of deionized water.

Table 10.1 Sampling Frequency, Period and Time of Day

Sites	Measure(s) or Indicator(s)	Brief Description of Location	Type of Site	Frequency	Type of Sample Collected	Time of Day Sampled	Special Weather Conditions
BR1	TSS, TP, turbidity	Southeast side of intersection of Birch Road and Long Pond Road; in intermittent stream, at culvert exit	Upstream location	Pre-construc: 1 wet weather Post-construc: 3 wet weather	grab	anytime	Wet weather= 0.25" of rain or more
BR2	TSS, TP, turbidity, flow	At pipe outfall; southeast of intersection of Birch Road and dirt cross street	Downstream location.	Pre-construc: 1 wet weather Post-construc: 3 wet weather	grab	anytime	Wet weather= 0.25" of rain or more
CA1	TSS, TP, turbidity	Cottage Avenue at end of grassed swale before pipe opening	Downstream location	Pre-construc: 1 wet weather Post-construc: 3 wet weather	grab	anytime	Wet weather= 0.25" of rain or more

Table 10.2 Field Blanks and Duplicates Collection Schedule

Site	Sampling Event	Parameter	Field Blank	Field Duplicate
BR1	Pre-construction wet	TSS, TP, turbidity,	Yes	Yes
BR2	Post-construction wet (1)	TSS, TP, turbidity, flow	Yes	Yes
CA1	Post-construction wet (2)	TSS, TP, turbidity,	Yes	Yes
BR1	Post-construction wet (3)	TSS, TP, turbidity,	Yes	Yes

It is not acceptable to not have field QC data for any one parameter at any sampling event. Therefore, all four samples at one collection site per sampling event will have field blanks and field duplicates, hence, 33% field blank and duplicate collection rate. One bottle will be used to collect TSS, TP, and turbidity at each sampling location. A separate sample bottle will be used to collect the field duplicate and the field blank. For flow sampling at BR2, flow will be measured three times using a five-gallon pail and a stop watch.

11. Sampling Method Requirements

One acid-washed polyethylene bottle will be used to collect TSS, TP, and turbidity for each sample site. TSS, TP, and turbidity will be collected as a mid-stream grab sample at sites BR1 and CA1. Site BR2 is an end-of-pipe sample. The bottle will be placed below the pipe in the center of the flow. Volunteers will take precautions not to touch the lip of the bottle to the pipe. Samples will be stored immediately in a cooler at 4 degrees Celsius until drop off at the lab.

Flow will only be collected at BR2 following CN 68.0 Flow Measurement SOP, Division of Watershed Management, DEP.

Table 11.1. Container, Sample Size, Type, Preservation and Storage for Common Water Quality Indicators (Standard Methods 20th edition, 1998)

Indicator	Container Type ¹	Minimum Sample Quantity (ml) ²	Sample Type ³	Preservation	Maximum Holding Time
Phosphorus, total	P, G Acid-washed; no use of detergent permitted	100	g	Freeze	12 months
Turbidity	P, G	100	g	Cool at 4°C	48 hr
Total Suspended Solids	P, G	500	g	Refrigerate to 4°C	7 days

1 Container — P = polyethylene or equivalent; G = glass

2 Minimum Sample Quantity – plan at least two minimum sample quantities for reanalysis contingencies

3 Sample Type — g = grab; c = composite

Table 11.2 Table of Sampling Methods

Indicator	What Will Be Sampled	Sampling Equipment	Sampling Method
TSS	Water	Acidwashed Polyethylene bottle	Grab sample/EPA Volunteer Methods Manual for Streams
TP	Water	Acid-washed polyethylene bottle	Grab sample/EPA Volunteer Methods Manual for Streams
Turbidity	Water	Acid-washed Polyethylene bottle	Grab sample/EPA Volunteer Methods Manual for Streams
Flow	Water	5 gallon bucket	CN 68.0 Flow Measurement SOP Div. Watershed Management, DEP

12. Sample Handling and Custody Requirements

All samples taken for lab analysis, as described in Section 11 above, are labeled in the field using the standard labels in Table 9.1. The labels will be affixed to dry bottles. A portable cooler with ice packs will be used to transport the samples to the labs. All samples will be delivered to the lab within 6 hours of sample collection. Samples will be cooled at 4 degrees Celsius, or frozen if held overnight. Chain of custody forms will be signed and dated when samples are transferred.

13. Analytical Methods Requirements

As mentioned above, sample analysis will be performed at Berkshire Enviro Lab (BEL) in Lee. Flow will be sampled in the field by volunteers. The Project Coordinator will calculate the flow rate based on the flow measured in the field.

Table 13.2. Sample Methods

Indicator	Method Number	Source	Reporting Units	Modifications or options
TP (BEL)	4500-PE	Standard Methods	mg/l	
Turbidity (BEL)	180.1	EPA Methods	NTU	
TSS (BEL)	2540D	Standard Methods	mg/l	

14. Quality Control Requirements

A. Field QC checks

Thirty-three (33) percent of samples collected per sample event will be duplicates (replicates). In addition, the project manager will observe volunteers during sample collection to verify proper sampling procedures.

B. Laboratory QC Checks

Berkshire Enviro Labs will provide their protocols and standard operating procedures to DEM. DEP through their current contract with BEL and LAPA-West already have copies of BEL's QAPP and SOPs.

C. Data Analysis QC Checks

After initial data entry by one person, a different person will verify that the entries are correct. The monitoring coordinator will be one of the two, the other will be a volunteer recruited to do so.

Table 14.2. Sample Table: Quality Control Checks

Indicator(s)	Accuracy Checks	Precision Checks	% Quality Control Samples
Flow	Field Triplicate	Field Triplicate	100%
Turbidity	Field blank	Field and lab duplicate analysis	33%
TP	Field blank	Field and lab duplicate analysis	33%
TSS	Field blank	Field and lab duplicate analysis	33%

The QA officer will review field sheets and flow measurements as collected and recorded by the volunteers. The QA officer will also review lab results and look for irregular results based on the DQOs.

15. Instrument/Equipment Testing, Inspection, and Maintenance Requirements

Laboratory analysis equipment testing and inspection will be the responsibility of BEL. Refer to BEL's QAPP for specifics. Corrective action for the equipment simply involves the replacement of the equipment if not in good condition. Refer to BEL's QAPP for corrective actions for lab equipment.

Table 15.1. Equipment Inspection and Maintenance.

Equipment Type	Inspection Frequency	Type of Inspection	Available Parts	Maintenance, Corrective Action & Record keeping
Polyethylene Bottles	Before each sampling date	Visual, no cracks		Replace bottles Logbook notation
5 gallon bucket (flow)	Before each sampling date	Visual, no cracks		Replace bucket if needed Logbook notation
Wrist watch (flow)	Before each sampling date	Visual, check for accuracy CALIBRATION?		Replace if slow or fast

16. Instrument Calibration and Frequency

BEL will be responsible for calibration of any equipment used in analysis, as specified in their SOPs. The stop watch for flow measurement will be checked against a second clock.

17. Inspection/Acceptance Requirements for Supplies

Collection bottles will be procured from the lab and inspected by the Project Monitoring Coordinator. The cooler and ice packs will be provided by the Project Monitoring Coordinator. The Project Monitoring Coordinator will provide a checklist for volunteers of all supplies they need to have in the field. Any supplies that fail inspection will be immediately replaced and their replacement inspected prior to use.

Table 17.1. Recommended Inspection for Supplies.

Supplies	Inspection Frequency	Type of Inspection	Available Parts	Maintenance
Field and Lab sample sheets	Before each sampling date	Visual	Additional copies	
Sample Bottles	Before each sampling date	Integrity, cleanness and seal for nutrient bottles, equipment or rinsate blank for reused bottles	One set of spare bottles	
Cooler	Before each sampling date	Cleanness, Ice packs, check for leaks		Annually or as needed

18. Data Acquisition Requirements

In addition to the data collected from the sampling, the Project Monitoring Coordinator will collect precipitation data from the National Weather Service (NWS) for the 72 hour time period before the sampling event and for the actual storm event if it is a wet weather sampling. The NWS provides a forecast for eastern Hampden County with current conditions data and precipitation amounts from Westover Air Force Base in Chicopee.

19. Data Management

All field data sheets will be signed by the sampling volunteer(s) and submitted with the chain of custody forms to the lab. Lab data will be forwarded to the Project Monitoring Coordinator with the field data sheets and the chain of custody forms. The Project Monitoring Coordinator will review the field data sheets for inconsistencies and missing information and attempt to fill in information by contacting the volunteer(s) responsible for the field collection. Any new information will be noted as such, dated, and its source documented. The project's QA officer will make field visits at sampling events and review materials and samples turned into the Project Monitoring Coordinator.

Lab data results and the information from the field data sheets will be entered into an Excel spreadsheet by the Project Monitoring Coordinator. The data entry will be checked against the field and lab sheets by a second person. To ensure that it was entered correctly.

The original data sheets, chain of custody forms, and Excel spreadsheet will be stored at PVPC with disk back up. Copies of the data will be forwarded to DEM for secondary storage.

20. Assessment and Response Actions

Assessment of the water quality monitoring program will be the responsibility of the Project Monitoring Coordinator. The Coordinator will accompany volunteers during wet weather monitoring events to evaluate the volunteers. Any necessary re-training will be accomplished on-site during these evaluation sessions. The project QA officer will also make site visits during sampling events.

Assessments of the data will be the responsibility of the TAC. If occasional data occurs outside the Measurement Quality Objectives, the data will be discarded. If this consistently happens, the TAC will be consulted to review the Measurement Quality Objectives and revise the program.

21. Reports

The Project Monitoring Coordinator will report data results to the volunteers, and the TAC at Advisory Committee meetings for the larger Pequot Pond project. As mentioned in the background section, this project is being funded as a DEM Lakes and Ponds Demonstration grant. As such, the project involves installing structural BMPs for managing stormwater runoff to the pond, installing a goose control demonstration site, and conducting public outreach to residents about controlling nonpoint source pollution from their properties. Quarterly reports will be submitted to DEM, as well as forwarding paper copies of data as it becomes available from the lab. A final report will be issued at the conclusion of the Pequot Pond demonstration grant project, summarizing the data and how it relates to the effectiveness of the BMPs and reducing contaminant loading to the pond. Data will be released to the public through the public outreach component of this project. Data will be presented in an easily digestible format, useful for conveying educational objectives of the project. Only quality assured data will be released to the public.

22. Data Review, Validation, and Verification

Lab data will be forwarded to the Project Monitoring Coordinator and the QA officer with the field data sheets and the chain of custody forms. The Project Monitoring Coordinator and the QA officer will review the field data sheets for inconsistencies and missing information and attempt to fill in information by contacting the volunteer(s) responsible for the field collection. Any new information will be noted as such, dated, and its source documented.

23. Validation and Verification Methods

Table 23.1. Verification and Validation Procedures.

Verifying Group	When	Activity	Possible Corrective Measures and Notification
Project Monitoring Coordinator	When field data sheets and chain of custody forms are returned from the lab.	Collect, review volunteer field sheets for 1. outliers 2. illegible data entries 3. missing data	1,2 discuss with samplers. Correct simple problems. Flag problems that are not correctable. 3. Discuss with samplers, locate any missing sheets or data. Flag problems that are not correctable.
Lab Coordinator	At end of analysis	Review chain of custody sheets. Check for samples that exceeded holding time, arrived in improper condition (i.e. too warm, contaminated)	Reanalyze if possible. Flag any problems that are not correctable.
Project Monitoring Coordinator / Project QA Officer	When QC data are reported	1. Compare number of QC tests performed vs. number promised in QAPP. 2. Compare QC tests with targets or expected values. 3. Spot check evaluations	1. Check to see if any QC results sheets are missing. 2. Check equipment, re-run calculations. 3. 1-3 re-run QC tests if possible. Flag any problems that are not correctable.

24. Reconciliation with Data Quality Objectives

The Project Monitoring Coordinator and the QA officer will evaluate the actual data against the data quality objectives upon receipt from the lab. If data is suspect, it will be rejected. The cause of failure will be evaluated and recorded to omit repeat mistakes. If the cause is found to be within the protocols of the program, the protocols will be improved before the next sampling event. If the cause is found to be within the sampling team, the team members will be alerted to the problem and retrained. Any limitations on data use will be documented in all reports, including draft and final reports.

If failure to meet project specifications is found to be unrelated to equipment, methods, or sampling error, specifications may be revised prior to the next sampling event. The project QAPP will be revised to reflect the proposed changes and submitted to DEM for approval.

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D: Birch Road Analytical Results



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Massachusetts DEP WERO

Project #01-12/MWI

L- 8604

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RE: LAPA

SAMPLE NUMBER	124398					
DATE COLLECTED	11/13/02					
TIME COLLECTED	8:46am					
COLLECTED BY	A. Capra					
SAMPLE LOCATION	Pequot Pond - A-BR2					
ANALYSIS	UNITS	RESULTS	DETECTION LIMIT	METHOD NUMBER	ANALYST	DATE ANALYZED
Total Phosphorus (as P)	mg/l	0.35	0.01	SM 4500-P-B,E	B.W.	11/19/02
Total Suspended Solids	mg/l	27	1	SM 2540 D	B.W.	11/14/02
Turbidity	NTU	32	0.01	SM 1230 B	B.W.	11/13/02

SAMPLE NUMBER	124399					
DATE COLLECTED	11/13/02					
TIME COLLECTED	8:46am					
COLLECTED BY	A. Capra					
SAMPLE LOCATION	Pequot Pond - B-BR2					
ANALYSIS	UNITS	RESULTS	DETECTION LIMIT	METHOD NUMBER	ANALYST	DATE ANALYZED
Total Phosphorus (as P)	mg/l	0.35	0.01	SM 4500-P-B,E	B.W.	11/19/02
Total Suspended Solids	mg/l	24	1	SM 2540 D	B.W.	11/14/02
Turbidity	NTU	32	0.01	SM 1230 B	B.W.	11/13/02

SAMPLE NUMBER	124400					
DATE COLLECTED	11/13/02					
TIME COLLECTED	8:46am					
COLLECTED BY	A. Capra					
SAMPLE LOCATION	Pequot Pond - C-BR2					
ANALYSIS	UNITS	RESULTS	DETECTION LIMIT	METHOD NUMBER	ANALYST	DATE ANALYZED
Total Phosphorus (as P)	mg/l	<0.01	0.01	SM 4500-P-B,E	B.W.	11/19/02
Total Suspended Solids	mg/l	<1	1	SM 2540 D	B.W.	11/14/02
Turbidity	NTU	0.13	0.01	SM 1230 B	B.W.	11/13/02

< = Less Than > = Greater Than ND = Not Detected

William S. Enser, Jr.
Director

E: Vegetated Buffer How-To Guide

Using Vegetated Buffers to Control Canada Geese: A How to Guide

Prepared By
The Pioneer Valley Planning Commission

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INTRODUCTION

Canada geese have become one of the most notorious waterfowl species of all time due to its year-round presence on lakes and ponds in New England. Historically a migratory species, the Canada goose, *Branta canadensis*, migrated through the northeast from breeding grounds in Canada to wintering grounds in the southern States. Called “resident” geese, Canada geese have adapted their life cycle to the four seasons and the abundant and safe grazing habitat afforded by parks, golf courses, and crop fields.

At sexual maturity, about three years, Canada geese will find a mate and establish a nesting territory in the area where they learned to fly. Canada geese generally mate for life but if one of a pair dies, the other will re-mate. Canada geese are probably the most adaptable and tolerant of all waterfowl. If left undisturbed, they will readily establish nesting territories on any suitable pond or lake.

There are numerous techniques in use today to deter Canada geese from occupying parks, golf courses, and other places enjoyed by the public mostly due to the feces left behind by the birds. A single Canada goose is estimated to produce up to 1,200 pounds of droppings per year. In addition to being a physical nuisance, the feces contribute to poor water quality. Runoff from feces littered shorelines can have higher levels of nutrients and bacteria. Control strategies being used throughout New England include chemical repellents, pyrotechnics, physical barriers such as fencing and dense vegetative borders, frightening methods, and population control methods such as addling and regulated hunting.

This paper discusses the methodology for creating unfavorable habitat for Canada geese through the use of vegetated buffers. Known to be lazy creatures, Canada geese prefer areas of short grass adjacent to water for grazing. Dense hedgerows discourage geese from coming on shore. Tall plants may also hide predators making geese wary to explore these places. By using plants native to New England, the hedgerow benefits the pond in other ways including providing food and habitat for birds and small mammals, stabilizing the shoreline and preventing erosion, and filtering pollutants from stormwater runoff.

SITE SELECTION

If you are considering installation of a vegetative buffer to control geese, you are probably aware of the location(s) where geese are coming ashore and congregating. If the buffer is to be installed on a residential property, you’ll want the majority of the shore frontage to be covered by a buffer

IDENTIFYING CANADA GEESE

Canada Geese (*Branta canadensis*) are easily identified by their long black neck with a black head, crown and bill. They also have a contrasting white cheek and throat area and white undertail covert. Their back, upper wings and sides are dark brown with a lighter brown (sometimes, nearly white) breast and belly. They have a short black tail and black legs with black webbed feet. Canada Geese are large birds, ranging from 20 to 50 inches long with wingspans of up to 68 inches.



strip. You should plan on extending your buffer at least 20 feet from the shore -the thicker and larger the buffer, the greater your chance of eliminating Canada Geese.

Regardless of where you initially think the buffer should be installed, you should first evaluate potential locations by considering the following:

Habitat Assessment: You'll want to install your buffer on a site frequented by geese; however, you'll need to consider other species before making final site selection. The presence of rare or endangered species habitat, for example, must be evaluated during this process. You may need to consult state or local officials for this information. You may even be prohibited from installing your buffer in certain circumstances. This assessment will, more than likely, also be part of the Wetlands Protection Act permitting process.

Property Owner: You may or may not own the property on which the buffer is to be installed. If you are not the owner, it is important to meet and establish a relationship with the owner of the property. Not only will you need cooperation, but the landowner will most likely be the applicant if permits are required. The property owner must also allow access during the entire process: planning, construction/installation, post-planting inspections and maintenance.

Current and Future Site Use: You must consider how the site is currently being used. For example, maybe the site you are considering is a popular fishing or swimming destination. This type of heavy use can cause damage to plants and may make it difficult for them to survive. Spend some time at the property evaluating current use and don't be afraid to ask local officials if the site is publicly owned. Future site uses are also important to consider. For example, if a boat ramp or dock is to be installed, you'll want to wait for the construction to be complete before you plant, or pick a new location.

Access: You must consider ease of access to the site, for yourself and others. You'll want a location that allows you easy access for planting and maintenance. Remember, you'll be moving soil and many plants. You don't want poor access to obstruct your work. If the site is on publicly-owned land, you'll want to consider installing fencing around your buffer to prevent people from trampling the plants while they are still small. You may also want to consider interpretive signage to inform the public about the project.

PEQUOT POND DEMONSTRATION SITE: SITE SELECTION

PVPC and DEM staff conducted two site visits at Pequot Pond and selected four potential locations for goose demonstration sites. One site, located southwest of the Hampton Pond State Park beach, was chosen for the demonstration site; however, all four sites were included in the permitting process for future plantings. Although a popular fishing location, the chosen demonstration parcel was identified as the most common gathering point for geese. The site was also highly visible to park goers which meant a greater opportunity to inform the public about using vegetative buffers for controlling Canada geese.



DESIGN FOR YOUR SITE

A site survey can be used to inventory the current conditions of your sites. You should draw a base plan for each potential location indicating plants, views, drainage, and topography. You'll also want to include accurate site measurements and photos.

A site survey for your waterfront property should also include:

- areas where wildlife are observed;
- existing uses such as beaches, boat docks, picnic areas, or fishing holes;
- water depths along the shore;
- steepness of slope moving inland from the shore
- soil moisture and type;
- areas eroded or prone to erosion - both upland and along the shoreline;
- inventories of existing plants including existing invasive and native plants, dead trees (downed logs are valuable wildlife habitat); and
- access to the site including trails.

PERMITTING

Due to its proximity to water resources, your vegetative buffer may require a permit under the Wetlands Protection Act. You will need to consult the appropriate regulatory agency such as the Massachusetts Department of Environmental Protection and the local Conservation Commission. Depending on the extent of your buffer, you may wish to consult a professional consultant to complete this task for you.

It is important that the permitting be done far enough in advance to avoid potential delays in the installation of your work. One or more fees may also be involved in this process. You may wish to include all potential candidate sites on your permits for future plantings. Once you have approval from applicable local, state, and federal authorities, you will begin planning the installation of your vegetated buffer.

PEQUOT POND DEMONSTRATION SITE: PERMITTING

After receiving permission from the landowner, a Request for Determination of Applicability (WPA Form1) was filed with the Westfield Conservation Commission. Pursuant to the Massachusetts Wetlands Protection Act, review of the local Conservation Commission was not needed as the planting of native plants was considered an exempt minor activity in the buffer zone in accordance with 310 CMR10.00 (The Massachusetts Wetlands Protection Act). Therefore, the Conservation Commission issued a Negative Determination which meant no further permitting was required.

SPECIES SELECTION

After you have decided where to install your vegetated buffer, you need to decide what types of plants to install. It is important to choose native species that will grow best in your soil, light, and moisture conditions. Begin by looking at similar landscapes surrounding your lake or pond. It may be helpful to use a canoe or boat to examine the entire shoreline, and you may wish to invest in a plant identification manual to assist with this task. Take pictures of the plants that you can't identify and consult a local nursery, friend, professional, or the World Wide Web for assistance.

Contact your local nursery far in advance to insure availability and suitability of plants. If you have difficulty locating native plants, your nursery may grow specific species for you. In any case, ordering should be done far in advance to avoid last-minute complications.

PEQUOT POND DEMONSTRATION SITE: SPECIES SELECTION		
Common Name	Latin Name	Growing Conditions
Silky Dogwood	Cornus amomum	A fast growing, clump forming shrub reaching 5 to 8 feet tall. Reddish winter color on young stems. Blue fruit in fall eaten by many animals. Provides nesting and cover habitat for birds.
Red-Osier dogwood	Cornus sercea	This rapidly spreading shrub reaches 6 to 10 feet tall. White flowers in June and showy red stems in winter. Blue berries in fall and twigs provide food for a variety of wildlife. Good for streambank planting.
Meadowsweet	Spirea latifolia	Low, spreading shrub from 2 to 4 feet tall, grows in moist fields and drier uplands. Attractive white to pinkish flowers in July.
Winterberry	Ilex verticillata	Shrub to 11 feet tall. Tolerates wet to dry sites, sun to part shade. Bright red berries persist into winter and are important wildlife food.
Rugosa Rose	Rosa rugosa	Very hardy shrub from 4 to 6 feet tall. Showy pink or white blossoms form red rose hips, a good food source for wildlife. Dense bristly stems. Tolerates drier sites.
Sweet Pepperbush	Clethra alnifolia	Shrub to 11 feet. Sweet smelling white flowers in July. Provides food and cover for birds. Tolerates dry sites.
Sweetgale	Myrica gale	Slow growing shrub to 10 feet tall with persistent leaves through winter. Blueish-gray waxy berries provide winter food for songbirds. Nitrogen fixer.

SITE LAYOUT

Once you have selected your species, you'll need to design the layout, i.e. where to plant them. Your layout can be a copy of nature, a natural design found elsewhere on your lake, or it can be your own design. Keep in mind that light, soils, and moisture will dictate where plants should be installed. Indicating the locations of specific plants on your site plan will make the installation much easier. If this seems overwhelming, contact a professional landscape architect.

Generally, your site will be divided into zones. These zones may have different moisture content, soils and light. Consult your nursery to determine spacing between plants and shrubs. Remember, your design must be relatively dense in order to truly discourage Canada geese. Don't be too concerned about gaps in your buffer as these areas will fill in over time. Fencing may be needed at the water's edge for the first few years to keep geese out of these gaps while the plants are growing in.

SITE PREPARATION AND INSTALLATION

If your site contains lawn grass or invasive species, you'll need to remove them before installing your buffer. Turf can be removed with an herbicide or by mechanical means. Both will eliminate turf, but herbicides are cheaper and quicker. Be careful to avoid spray drift. If your site contains invasive plants, you need to eradicate them prior to installing your riparian strip. This can be very difficult and may take several growing seasons.

If you are not familiar with planting trees and shrubs, you may wish to consult your local nursery or the World Wide Web. General planting tips include the following:

- Plant in the spring or fall
- If you are working in a large area, you may wish to conduct the planting over several seasons
- When you receive your plants from the nursery, ensure they are healthy
- If you have difficulty identifying plants, make sure your nursery has identified each pot or plug

Some basic directions for installing plants are:

- Begin your planting by digging a hole that is deep enough so that the root ball rests on undisturbed soil and the surface of the root ball matches the soil surface
- Thoroughly soak the plant before installing it in the ground
- Break away the roots from the pot and place plant into hole on mounded soil
- Return soil to hole and tamp around roots
- Water thoroughly and apply mulch (properly selected native plants should never need fertilizing)

FENCING AND INTERPRETIVE SIGNS

If your vegetated buffer is located on public property or land that is heavily used, you may wish to install fencing and interpretive signage. Fencing may either be temporary or permanent but should be installed to keep humans from trampling your work. Your site may take several growing seasons to fully develop and fencing should be installed to protect it during this period. Signage will educate others as to the purpose of your planting and help deter vandalism. Your sign should include the purpose of the planting, a species list, and a list of project partners (if any). It's also important to include contact information should others have questions or wish to duplicate your work on their property.



MAINTENANCE

Until the plants are well-established, maintenance of the planting will consist of routine removal of invasive weeds and watering. Your method for weeding will depend on species, but may involve hand-pulling or spraying an herbicide. Be familiar with the plants you installed to be sure what plants to remove. Attentive weeding the first year is very important to the success of your work.

Until well established, your buffer will require approximately 1" of water per week. This can be accomplished naturally by rainfall or by manual watering. By the second growing season, your buffer should only require watering during drought months.

Depending on the amount of traffic your site receives, the fence may need routine repair or even replacement.



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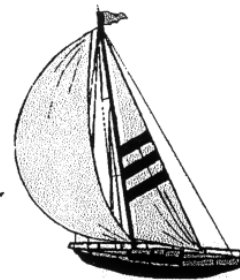
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F: BMP Outreach

The Focus

A Hampton Ponds Newsletter

Issue #13 Winter 2003



A Letter from FOCUS Founder, Bruce Martin

Well, the Holidays are over. Santa has come and gone. Now can we finally get back to normal? Is Christmas a hectic season or what?

Anyway, we are knee deep in snow, but we need to get through. Hey, we're New Englanders; we know how to do it. Hate to say it, but "been there, done that." The biggest thing is to be safe. Buckle up, keep a little pail of sand in the back of your car or truck. Travel with a spare blanket, a candle and a shovel. Make sure to clean all the ice and snow off your vehicle before you take off. Make sure your lights are cleaned off. Be sure to drive with caution due to the conditions, and watch out for (you know who) the other guy.

For you skiers, here's your year; enjoy yourself. For those of you who don't ski, don't let yourself get down. Try to get out and find some beauty in all this snow. Enjoy the Ponds. It's really a great place to spend ALL the seasons.

Bruce D. Martin
FOCUS Founder

4th of July Boat Raffle

Benefiting the Pequot Pond Restoration Project

Enter to Win a 14' Deep V Alumacraft
with Johnson 9.9 HP motor, Trailer,
Jack, Oars and Life Vests
(\$6000 Retail Value)

Only 700 Tickets Available.
Drawing to be held at the HPA
Community Building following the
4th of July Parade.

Tickets on sale now; \$20 each.
Contact Nancy Valego @ 534-0682.

2003 Hampton Ponds Ice Fishing Derby Goes Over the Top!!!

Submitted by Sandy Moffett

Our best derby ever was held on Super Bowl Sunday on Hampton Ponds. A brisk day brought over 200 adults and children out to try their skills in hooking the big one. At 4:30 a.m. you could find Joe Moffett, Pete Sanuita and Junior Helliwell setting up the food tables and starting the camp stoves near the boat ramp. Mike Potenza and Paul Leichsenring tended to the cooking of hot dogs, cocoa and great chili (Paul made some awesome chili to go with the hot dogs!) while Sandy Moffett and Janet Plante



scrambled to print off more tickets. It was a great community effort with our largest donation ever being given to the Hampton Ponds Association Scholarship Fund.

Ice games were a new event this year, sponsored by the Ice Holes Fishing Club. This was a fun event for all who participated, and plans are already underway to include special children's ice games next year. Many thanks to Russ Boudreau for organizing the games. The relay races were awesome. That camp stove just wouldn't light, huh Jimmy (Hockenberry)?

Many thanks to the many vendors for their donations. Your generosity really assisted in making our event a great success! Donors included: Whip City Speedway, US Line Co., Froggie's Saloon, Collier's Sporting Goods, B&G Sporting Goods, Valley Sports, Debbie's Kitchen at Camp Jahn, Lambert Boat House, Lakeside Marketing, Country Store, Al Fresco Pizzeria, People's Savings Bank of Holyoke, and Danaher Tool Co.

Thank you also to Mary Bowler and Joe Blazej for their monetary donations.

In the Adult Division, 1st Place went to Steve Marcoux with a 2.9# bass. Steve went home with a cash prize of \$160. A 2nd Place cash prize of \$110 went to Dave Buchaan for a 2.3# pickerel.

In the Children's Division, 1st Place went to Shannon Guen who landed a 2.2# bass! 2nd Place went to Becky Brouillard with a 1.11# pickerel. Congratulations Shannon and Becky.

(continued)

Welcoming the 'Rock Valley Neighborhood Association'

The Rock Valley Neighborhood Association has been established for 3 years and currently has 12 active members. The group meets on the 1st Monday of each month. Any and all neighbors are invited to attend and participate. Current issues that the group has been working on include speeding, protecting the aquifer, as well as other environmental issues.

If interested in joining, contact Ron Cobb at 533-8249.

Pequot Pond Restoration Project

As watershed residents, you play a vital role in determining the overall health of Pequot Pond. A key component of improving the water quality is stopping non-point source (NPS) pollution. NPS pollution occurs when water (i.e. stormwater, snowmelt, water from a garden hose) flows throughout the watershed, picking up pollutants and depositing them into water resources (Massachusetts DEP). NPS pollutants are not easily identified, but most are directly related to the use of the land. Examples include: excess fertilizer, pesticides, oils, bacteria and nutrients from failing septic systems, pet waste, and other toxic chemicals from roadways and parking lots. These pollutants disrupt the natural ecosystem of Pequot Pond and negatively impact fish, wildlife and recreation.

A series of fact sheets have been selected by the Pioneer Valley Planning Commission (PVPC) and the Pequot Pond Watershed Restoration Advisory Committee to help watershed residents better manage their lands and help prevent NPS pollution from degrading Pequot Pond. Fact sheets are available that include:

- A topographic map of the Pequot Pond watershed boundary
- A DEP fact-sheet on how to establish vegetated buffer strips along lakes
- An educational brochure on NPS pollution in lakes and ponds
- Pointers for reducing NPS from boating and marinas (maintenance, sewage, waste, etc.)
- A septic system reference guide for homeowners
- Easy tips and good reference sources on lawn care in an environmentally sensitive way
- How to use rain barrels to collect and recycle rainwater
- How to construct a rain garden to help solve stormwater pollution problems

Residents are encouraged to review the fact sheets. We hope you will find this information useful, and that it will help you to help protect Pequot Pond. Please contact Matthew DelMonte or Robin Simmen at PVPC (413) 781-6045 if you would like additional information or require technical assistance.

Anyone Know These People?



G: Landscape Audits

Pequot Pond Landscape Audit

Name _____ Address _____

Personal Interview

1. Is viewing wildlife from your home:
____ very important ____ important ____ not important ____
don't care

2. Are views of the pond from your home:
____ very important ____ important ____ not important ____
don't care

3. Do you access the pond for recreational use from your property?
____ Yes ____ No

What types of recreational activities:

____ Fishing ____ Boating (motorized) ____ Canoe/Kayak
____ Swimming ____ Other

4. Do you use a lawncare company? If so please list: _____

5. How often do you or your lawncare provider fertilize your lawn:
____ annually ____ 2x per year ____ 3x per year ____ 4x
per year

6. How often do you irrigate, for how long and at what time of day:
____ daily ____ weekly ____ during dry spells
____ other

7. How often do you or your lawncare provider mow your lawn and to what height?

____ daily ____ weekly ____ other

8. Do you have pets: ____ Yes ____ No

How do you get rid of pet waste? _____

Landscape Character

1. Estimate of impervious surface on lot

2. Is runoff from lot directed toward pond or a storm drain?

Where is the closest storm drain?

3. Are gutters discharging to lawn, to dry wells, or to street/driveway?
Are they causing erosion?

4. Is there outdoor storage of chemicals (fuel oil, fertilizers, herbicides) and waste?
Location and how is it stored?

5. If on-site septic system, are there signs of failure i.e. wet spots, odors, lush and dark green vegetation?

6. Presence of native plants vs. exotic species (list all invasives)

Driveway and Street

1. Signs of clippings, fertilizer, sediment, oils/sheens

2. Is driveway paved or dirt/gravel? Signs of erosion?

3. Is driveway or road bordered by vegetated strips?

Lawn

1. Is lawn obviously over/under cared for i.e., excess fertilizer, over watered?

2. Height of grass (2.5 to 3" ideal)

3. Are grass clippings recycled into lawn or composted?

4. Is lawn littered with pet waste?

5. What irrigation methods are used on the property?

Shoreline

1. Are there apparent Wetland Protection Act violations (e.g. filling)

2. Percentage of
-grass _____
-soil/sand _____
-rock _____
-natural vegetation _____

3. Is there a vegetated buffer? If yes, estimate width:

____yes ____no width (feet)_____

4. Condition of shoreline i.e., evidence of sedimentation or invasive plants?

5. Does the property have a dock with a motorized boat?
Signs of leaks?

6. Is there a private boat ramp with direct discharge?

Recommendations and Information Provided to the Participant:

Pequot Pond Watershed Landscape Audit

Owner: Nancy Valego
Address: 27 Freyer Road, Southampton

Nancy Valego lives in a two-story home on a one-acre parcel located at the end of a small peninsula on Freyer Road along the Southampton shore of Pequot Pond. The property includes a large deck with over 500 feet of pond frontage. Nancy and her family enjoy views of the pond and wildlife from her property, however, privacy is also important. Swimming, boating, skiing, and ice skating are also year-round recreational activities that the Valego family enjoys from their home.

Dock on Pequot Pond



The yard is cared for by Nancy, an avid gardener, and her son. The property is well-landscaped with a variety of ornamental shrubs and small trees including rhododendrons, azaleas, and Japanese maple. Although these species are non-native to New England, they do not have aggressive growth patterns and are generally not considered invasive. Some invasive and non-native species have established on the property including Morose honeysuckle and greenbriar. Nancy has removed a large amount of greenbriar from the property and is being vigilant about hand pulling new shoots as she finds them. The rest of the property is covered by a mature white pine canopy with mountain laurel understory.

Nancy is aware of the dangers excessive nutrients from landscape fertilizing can have on the pond. The lawn is not fertilized or watered on a regular basis. Landscape shrubs have received direct applications of fertilizer but Nancy has not noticed this to improve the flowering of the shrubs. Nancy waters landscape plants on an as needed basis. The grass is cut regularly and the clippings are used as mulch or layered along the pond bank on the south side of the property to add organic matter and control erosion being caused by boat wake. Nancy has one beautiful chocolate lab and manages pet waste by either bagging it, and disposing of it in the trash or walking the dog further down the road, away from the shore.

The property is covered by approximately 15% impervious surface including the home, decks, and driveway. With the exception of two small docks, the entire shoreline is buffered with vegetation ranging from two to ten feet in width. Runoff from the property is directed mostly toward the pond with erosion noticeable along the western shoreline. This erosion had caused trees to fall in past years and was probably caused by boat wake. The sandy soil has made it difficult for plants to establish in this area. In addition, the opening where the tree came down is used as a path to the pond on this shore which is aggravating the erosion.

The septic system appears to be functioning optimally and is located in the front of the house next to the driveway. Nancy is interested in design recommendations for this area that may provide visual interest and further screening from the neighbor.

Septic System in Front Yard



Recommendations:

1. Manage greenbriar and honeysuckle – Continue to remove greenbriar as you have been doing. If hand pulling plants does not seem to reduce the population, spot treatment with a glyphosphate herbicide such as Roundup is appropriate. Hold Roundup spray nozzle 4-6 inches from leaf surface and spray directly onto plant, coating leaf surface. Two to three applications of Roundup may be required over a one to two year period before greenbriar roots die off. Glyphosphate herbicides have a short half-life meaning they persist for a very short amount of time in the environment before dissolving. This makes them less likely to have negative effects on surrounding plants and animals.

This same treatment protocol can be used with the Morose honeysuckle. Often admired for its fragrant spring bloom and succulent red berries, honeysuckle is an extremely aggressive invasive plant. Once established, it quickly out-competes other woodland shrubs and takes over vast areas.

2. Maintain leaf litter along shoreline

Continue to maintain shoreline in as natural a condition as possible. This includes leaving leaf litter on the ground to prevent soil erosion. Lawn clippings should be spread where other low-growing plants such as ferns are absent. Actively growing plants are more beneficial to the shoreline than a layer of mulching grass clippings.

3. Plant perennial shrubs, grasses, and wildflowers in bare spots around property

Keeping as much of the ground vegetated as possible is important for controlling runoff and the associated sediment from entering the pond. Continue to fill in the area next to the dock with shrubs that tolerate full sun to part-shade such as Sweet Pepperbush (*Clethra alnifolia*), Sweet Fern (*Comptonia peregrina*), American Cranberry bush (*Viburnum trilobum*), or Wild Raisin (*Viburnum cassinoides*). For the back yard, consider low growing grasses as a ground cover. For the front yard along the edge of the woods plant American Hazlenut (*Corylus americana*) and Sweet Fern (*Comptonia peregrina*). For area on west side of property suffering from erosion, plant low-growing spreading shrubs such as Sweet Fern.

Yard next to dock



Back Yard



Pequot Pond Watershed Landscape Audit

Owner: Gary Krause
Address: Pequot Point, Westfield
Date: October 2, 2003

Gary Krause's family has owned the island located off of Pequot Point for many years. In recent years, the Krause family has watched as the shoreline of their island slowly disappears into the pond. The majority of the erosion is on the steeper north side of the property where boat wake is the likely culprit. This steady washing away of the island is of great concern to Mr. Krause.



The island is used by the Krause family and friends for gatherings and recreation. The perimeter of the island is well marked with "no trespassing" signs and is almost entirely fenced with chain link fence. Several small docks are also located along the shore. The property has apparently been used for storage throughout the years with many empty plastic drums, storage containers, and other types of building remnants located throughout the property. A small cottage once occupied the island but was burnt down several years ago. A small depression, remnants of a

concrete walkway, and some foundation elements are all that remain.



Mr. Krause and his family enjoy watching wildlife from the island, especially wood ducks and blue heron, and consider views of the pond very important. Fishing, boating, kayaking, and swimming are year-round recreational activities enjoyed from the island. During the warmer months, the island is used for picnics and barbecues and is equipped with electricity for catering family events. At

the time of the visit, no fuel oil of any kind was present on the island.

The island is mostly open in the center with trees and shrubs occupying the perimeter and shoreline. Dominant species include red oaks, white birch, blueberry, and mature white pines. A dense vegetated buffer comprised mostly of native species (highbush blueberry, alder, black gum, birch) covers the steep shoreline. The nonnative, invasive species Morose honeysuckle is present. Mr. Krause has also planted various herbaceous perennials around the island including hostas. The grassy areas in the center of the island are mowed once a month or as needed. Lawn clippings are used as mulch or as fill along the shoreline. Mr. Krause has been layering the shoreline around the island with branches, logs, fencing, and

rocks to help absorb the impact of the boat wake and control the steady erosion that is eating the toe of the slope.



Recommendations:

1. Manage

honeysuckle – Dig any honeysuckle found on island. If hand pulling plants does not seem to reduce the population, spot treatment with a glycolphosphate herbicide such as Roundup is appropriate. Hold Roundup spray nozzle 4-6 inches from leaf surface and spray directly onto plant, coating leaf surface. Two to three applications of Roundup may be required over a one to two year period before roots die off. Glycolphosphate herbicides have a short half-life meaning they persist for a very short amount of time in the environment before dissolving. This makes them less likely to have negative effects on surrounding plants and animals. Often admired for its fragrant spring bloom and succulent red berries, honeysuckle is an extremely aggressive invasive plant. Once established, it quickly out-competes other woodland shrubs and takes over vast areas.

2. Maintain leaf litter along shoreline

Continue to maintain shoreline in as natural a condition as possible. This includes leaving leaf litter on the ground to prevent soil erosion. Lawn clippings should be spread where other low-growing plants such as ferns are absent. Actively growing plants are more beneficial to the shoreline than a layer of mulching grass clippings.

3. Stabilize toe of shoreline slope

Boat wake can be a significant erosive force against a shoreline. The best defense is a well vegetated shore. Due to the significant slope of the shore and the abundance of various types of debris, it is not feasible to plant plants with large root balls. Therefore, it is recommended that live dormant shrub stakes be planted in the early spring. These stakes are pounded into the ground approximately 12-18" while still dormant. As the weather warms, the stakes begin to leaf out and root into the bank, creating a dense hedge and stable bank as they grow. Recommended dormant species include willows, dogwood, and alders. Bundles of dormant stakes can be purchased from New England Wetland Plants in Amherst, MA at (413) 548-8000.

Any structural stabilization such as the addition of riprap or bioengineering techniques would require a permit from the Conservation Commission. It is recommended that an engineer be consulted before any work other than the addition of plants be undertaken.

H: Rain Barrel Flyer and Press Release

ATTENTION

RESIDENTS IN THE VICINITY OF HAMPTON PONDS

Save water...Save money...Enjoy your garden
Order a Rain Barrel!

For the First 40 Orders:*

Special Price of \$30 - Save \$49 off the Regular price of \$79

*Limit 1 per household

All Other Orders:

Special Price of \$55 - Save \$24 off the Regular price of \$79

No Limit

Call The New England Rain Barrel Co. to order your rain barrel

and pick it up on August 9th

at The Hampton Ponds Association Building in Westfield from 1-3 PM

~Offer expires July 25th~

The New England Rain Barrel Company

www.nerainbarrel.com

Email: sales@nerainbarrel.com Phone number: (978) 977-3135

The Benefits of a rain barrel:

- Use water wisely by watering your garden with free water collected from your roof.
- You have plenty of water available during a water ban.
- Rain water is great for plants.
- Rain water is usually soft and free of dissolved materials.
- Great for your indoor plants as well as your garden.
- Decrease demands on the public water supply.

Hampton Ponds Association Building

Located on the corner of North (Route 202)
and Old Stage Roads in Westfield



Funded by the MA Department of Environmental Management Lakes and Ponds Program

PRESS RELEASE

CONTACT: Matt DelMonte, PVPC Planner, (413) 781-6045

FOR IMMEDIATE RELEASE
July 22, 2003

Rain Barrels Now Available for Hampton Ponds Area Residents

The Pioneer Valley Planning Commission will be offering rain barrels at a special price for residents living in the vicinity of Hampton Ponds in Westfield, Holyoke, and Southampton. As part of the Pequot Pond restoration project, the first 40 residents living in the vicinity of the ponds can purchase 55-gallon rain barrels for **\$30** (regularly \$85), limited to one barrel per household. This offer is valid until **August 7, 2003**.

To order a rain barrel, contact the New England Rain Barrel Company at (978) 977-3135 or sales@nerainbarrel.com. To provide the lowest cost, the company is arranging for a general delivery of the rain barrels on Saturday, August 9 at the Hampton Ponds Association building located on the corner of North (Route 202) and Old Stage Roads in Westfield, where residents may pick them up from 1:00 p.m. to 3 p.m.

Rain barrels allow the collection of water with no added chemicals to water plants, flowers, and gardens, even during drought conditions. Because the average roof will shed more than 5,000 gallons of water during the summer months, rain barrel collection is an excellent way to conserve water. Made from previously used barrels, they are retrofitted with a screened louver to keep insects out, brass spigots, and a five-foot hose with a shutoff valve.

For more information about the rain barrels, visit www.nerainbarrel.com. To learn about the Pequot Pond restoration project, please contact Matt DelMonte of the Pioneer Valley Planning Commission at (413) 781-6045 or mdelmonte@pvpc.org.

This project is being funded by the Massachusetts Department of Environmental Management's Lakes and Ponds Program.

I: Stormwater Bylaws

Draft Westfield Stormwater Management Ordinance

CHAPTER 29

Erosion and Sediment Control For Stormwater Management

SECTION 29-1. PURPOSE AND AUTHORITY

1. Purpose

A. The purpose of this ordinance is to better manage land development in order to protect, maintain, and enhance the public health, safety, and general welfare of the citizens of Westfield by establishing minimum requirements and procedures to control the adverse impacts associated with stormwater runoff.

B. The proper management of stormwater runoff will meet the following objectives:

1. Reduce the adverse water quality impacts of stormwater discharges to rivers, lakes, reservoirs and streams in order to attain federal water quality standards;
2. Prevent the discharge of pollutants, including hazardous chemicals, into stormwater runoff;
3. Minimize the volume and rate of stormwater which is discharged, to rivers, streams, reservoirs, lakes and combined sewers that flows from any site during and following development;
4. Prevent erosion and sedimentation from land development, and reduce stream channel erosion caused by increased runoff;
5. Provide for the recharge of groundwater aquifers and maintain the base flow of streams;
6. Provide stormwater facilities that are attractive, maintain the natural integrity of the environment, and are designed to protect public safety;
7. Maintain or reduce pre-development runoff characteristics after development to the extent feasible;
8. Minimize damage to public and private property from flooding;
9. Ensure that these management controls are properly maintained.

2. Authority

The Department of Public Works shall administer, implement and enforce this ordinance. Any powers granted to or duties imposed upon the Department of Public Works may be delegated in writing by the Board of Public Works to employees or agents of the Department of Public Works.

SECTION 29-2. DEFINITIONS

The following definitions describe the meaning of the terms used in this Ordinance:

Authorized Enforcement Agency: The Department of Public Works, its employees or agents designated to enforce this ordinance.

"Adverse impact" means any deleterious effect on waters or wetlands, including their quality, quantity, surface area, species composition, aesthetics or usefulness for human or natural uses which are or may potentially be harmful or injurious to human health, welfare, safety or property, to biological productivity, diversity, or stability or which unreasonably interfere with the enjoyment of life or property, including outdoor recreation.

"Best management practices (BMP)" are structural or biological devices that temporarily store or treat urban stormwater runoff to reduce flooding, remove pollutants, and provide other amenities. They can also be non-structural practices that reduce pollutants at their source. BMPs are described in a stormwater design manual, Stormwater Management, Volume Two: Stormwater Technical Handbook (March, 1997, Mass. Department of Environmental Protection, as updated or amended).

“Construction activity” is disturbance of the ground by removal of vegetative surface cover or topsoil, grading, excavation, clearing or filling.

"Design storm" is a rainfall event of specified size and return frequency that is used to calculate the runoff volume and peak discharge rate to a BMP.

"Detention" is the temporary storage of storm runoff in a BMP, which is used to control the" peak discharge rates, and which provides gravity settling of pollutants.
extended detention

“Disturbance” is any land clearing, grading, bulldozing, digging or similar activities.

"Drainage area" means that area contributing runoff to a single point measured in a horizontal plane, which is enclosed by a ridgeline.

"Drywell" is similar to an infiltration trench but smaller with inflow from a pipe; commonly covered with soil and used for drainage areas of less than 1 acre such as roadside inlets and rooftops runoff.

"Easement" means a grant or reservation by the owner of land for the use of such land by others for a specific purpose or purposes, and which must be included in the conveyance of land affected by such easement.

"Flow attenuation" means prolonging the flow time of runoff to reduce the peak discharge.

"Hydrology model” may include one of the following:

- TR-20, a watershed hydrology model developed by the Natural Resources Conservation Service act that is used to route a design storm hydrograph through a pond;
- TR 55, or Technical Release 55, "Urban Hydrology for Small Watersheds" is a publication developed by the Natural Resources Conservation Service to calculate stormwater runoff and an aid in designing detention basins;
- Hydrocad.

"Impervious surfaces" are areas, such as pavement or rooftops, which prevent the infiltration of water into the soil.

"Infiltration" is the downward movement of water from the surface to the subsoil.

"Infiltration trench"" is a stormwater management excavation filled with aggregate which removes both soluble and particulate pollutants. Trenches are not intended to trap coarse sediments.

"Outfall" is the terminus of a storm drain or other stormwater structure where the contents are released.

"Peak discharge" is the maximum instantaneous rate of flow during a storm, usually in reference to a specific design storm event

"Permeable soils" are soil materials with a sufficiently rapid infiltration rate so as to greatly reduce or eliminate surface and stormwater runoff. These soils are generally classified as NRCS hydrologic soil types A and B.

"Person" is any individual, group of individuals, association, partnership, corporation, company, business, organization, trust, estate, administrative agency, public or quasi-public corporation or body, the Commonwealth or political subdivision thereof.

"Retention" is the holding of runoff in a basin without release except by means of evaporation, infiltration, or emergency bypass.

“Start of construction” is the first land-disturbing activity associated with a development, including land preparation such as: clearing, grading and filling; installation of streets and walkways; excavation for basements; footings, piers or foundations; erection of temporary forms; and installation of accessory buildings such as garages.

"Swale" is a natural depression or wide shallow ditch used to temporarily store, route, or filter runoff.

SECTION 29-3. APPLICABILITY

1. Applicability

Prior to the issuance of any site plan approval or development permit for any proposed development listed below, a stormwater management permit, or a waiver of the requirement for a stormwater management permit, must be approved by the applicable Special Permit Granting Authority. No person shall, on or after the effective date of the ordinance, initiate any land clearing, land grading, earth moving or development activities without first complying with this ordinance. The following uses and activities shall be required to submit drainage reports, plans, construction drawings, specifications and as-constructed information in conformance with the requirements of this ordinance:

- A. Multi-family residential developments involving four or more units;
- B. Any new commercial, industrial, and institutional structures under the same ownership, with at least 5,000 square feet of gross floor area, 10,000 square feet of impervious surface, or that require 10 or more parking spaces.
- C. Redevelopment or additions to existing commercial, industrial, and institutional uses which result in an additional impervious surface area or gross floor area of greater than 5,000 square feet, or which results in an increase of 10 or more parking spaces.
- D. Subdivisions and construction activities of any kind disturbing greater than 40,000 square feet.
- E. Development or redevelopment involving multiple separate activities in discontinuous locations or on different schedules if the activities are part of a larger common plan of development that all together disturbs one or more acres.

2. Exemptions

To prevent the adverse impacts of stormwater runoff, the stormwater performance standards in Section 29-6 must be met at new development sites. These standards apply to construction activities as described under Section 29-3.1. The following activities are exempt from the requirements for submittal and approval of a stormwater management plan under Section 29-4, but must comply with the stormwater performance standards in Section 29-6:

- A. Any agricultural activity which is consistent with an approved soil conservation plan prepared or approved by the Natural Resource Conservation Service;
- B. Any logging which is consistent with a timber management plan approved under the Forest Cutting Practices Act by Massachusetts Department of Environmental Management;
- C. Additions or modifications to existing single family structures;
- D. Developments that do not disturb more than 40,000 square feet of land, provided that they are not part of a larger common development plan;
- E. Repairs to any stormwater treatment system deemed necessary by the Westfield Department of Public Works;
- F. Any emergency activity that is immediately necessary for the protection of life, property or the environment, as determined by the Department of Public Works; and
- G. Single family residential uses disturbing less than 40,000 square feet.

3. Stormwater Design Manual

A stormwater design manual, Stormwater Management, Volume Two: Stormwater Technical Handbook (March, 1997, Mass. Department of Environmental Protection, as updated or amended) is hereby incorporated by reference as part of this ordinance, and shall furnish additional policy, criteria and information including specifications and standards, for the proper implementation of the requirements of this ordinance.

This manual includes a list of acceptable stormwater treatment practices, including the specific design criteria for each stormwater practice. The manual may be updated and expanded from time to time, based on improvements in engineering, science, monitoring and local maintenance experience, at the discretion of the Westfield Department of Public Works or Massachusetts Department of Environmental Protection.

Stormwater treatment practices that are designed and constructed in accordance with these design and sizing criteria will be presumed to meet the minimum water quality performance standards.

SECTION 29-4 . PERMIT PROCEDURES AND REQUIREMENTS

1. Permit Required

No land owner or land operator shall receive any of the building, grading, or other land development permits required for land disturbance activities, and no land owner shall commence land disturbance activities, without approval of a Stormwater Management Permit from the Department of Public Works and meeting the requirements of this ordinance.

2. Application Requirements

Application for approval of a Stormwater Management Permit shall include the following:

- A. A stormwater management plan or an application for waiver shall be submitted to the Westfield Department of Public Works for review and approval for any proposed development specified in Section 3.1. Three copies of the stormwater management plan shall be submitted, and clearly labeled, along with other documents required in this zoning ordinance for site plan review. The plan shall contain supporting computations, drawings, and sufficient information describing the manner, location, and type of measures in which stormwater runoff will be managed from the entire development. The plan shall serve as the basis for all subsequent construction.
- B. An erosion and sediment control plan, which shall contain sufficient information to describe the nature and purpose of the proposed development.
- C. ongoing maintenance agreement
- D. non-refundable permit review fee

The applicant may request, and the Westfield Department of Public Works may grant, a waiver from any information requirements it judges to be unnecessary to the review of a particular plan.

3. Procedures for Review and Approval of Stormwater Permits

- A. The procedures for review and approval of stormwater management permits shall be consistent with (review procedures of DPW), as appropriate to the use.
- B. The Department of Public Works shall refer copies to the stormwater management permits to the City Engineer for review, and shall consider any comments submitted by the City Engineer during the review period.
- C. The Department of Public Works shall hold a public hearing within twenty-one (21) days of the receipt of a complete application and shall take final action within twenty-one (21) days from the close of the hearing unless such time is extended by agreement between the applicant and [insert appropriate board or department]. Notice of the public hearing shall be given by publication in a local paper of general circulation, by posting and by first-class mailings to abutters at least seven (7) days prior to the hearing.

4. Criteria for Review of Stormwater Permits

In addition to other criteria used by the Westfield Department of Public Works in making permit decisions, for the uses specified in this ordinance, the Department of Public Works must also find that the Stormwater Management Plan submitted with the permit application meets the following criteria:

- A. the Stormwater Management Plan and the Erosion and Sediment Control Plan are consistent with the Purposes and Objectives of this Bylaw in Section 29-1;
- B. the Stormwater Management Plan meets the Performance Standards described in Section 29-6;
- C. the Erosion and Sediment Control plan must meet the Design Requirements in Section 29-7.

5. DPW Action

The Department of Public Works' action, rendered in writing, shall consist of either:

- a. **Approval of the Stormwater Management Permit Application based upon determination that the proposed plan meets the purposes in Section 29-1 and the standards in Section 29-6 and will adequately protect the water resources of the community and is in compliance with the requirements set forth in this by-law;**
- b. **Approval of the Stormwater Management Permit Application subject to any conditions, modifications or restrictions required by the Board which will ensure that the project meets the purposes in Section 29-1 and the standards in Section 29-6 and adequately protects water resources, set forth in this by-law;**
- c. **Disapproval of the Stormwater Management Permit Application based upon a determination that the proposed plan, as submitted, does not meet the purposes in Section 29-1 and the standards in Section 29-6 or adequately protect water resources, as set forth in this by-law.**

Failure of the Board to take final action upon an Application within the time specified above shall be deemed to be approval of said Application. Upon certification by the City Clerk that the allowed time has passed without Board action, the Board must issue a Stormwater Management Permit.

6. Inspections

No Plan will be approved without adequate provision for inspection of the property before development activity commences. The applicant shall arrange with the DPW for scheduling the following inspections:

- A. Initial inspection: prior to approval of any plan
- B. Erosion Control Inspections: after site clearing, rough grading and final grading to ensure erosion control practices are in accord with the plan.
- C. Bury inspection: prior to backfilling of any underground drainage or stormwater conveyance structures;
- D. Final Inspection: when all work, including construction of stormwater management facilities and landscaping have been completed. Final inspection shall include a full, dated TV inspection of all stormwater pipes installed.

The Department of Public Works or its agent shall inspect the work and either approve it or notify the applicant in writing in what respects there has been a failure to comply with the requirements of the approved plan. Any portion of the work which does not comply shall be promptly corrected by the applicant or the applicant will be subject to the bonding provisions of Section 29-9 or the penalty provisions of Section 29-10. The City may conduct random inspections to ensure effective control of erosion and sedimentation during all phases of construction.

7. Right-of-Entry for Inspection

When any new drainage control facility is installed on private property, or when any new connection is made between private property and a public drainage control system or sanitary sewer, the filing of an application shall be deemed as the property owner's permission to the Westfield Department of Public Works for the right to enter the property at reasonable times and in a reasonable manner for the purpose of the inspection.

This includes the right to enter a property when it has a reasonable basis to believe that a violation of this ordinance is occurring or has occurred, and to enter when necessary for abatement of a public nuisance or correction of a violation of this ordinance.

8. Application Review Fees

The fee for review of any land development application shall be based on the amount of land to be disturbed at the site and the fee structure established by the Westfield Board of Public Works. All of the monetary contributions shall be credited to the utility enterprise fund, and shall be made prior to issuance of any building permit for development.

Section 29-5. The Stormwater Management and Erosion Control Plan

1. Contents of the Stormwater Management and Erosion Control Plan

The application for a stormwater management permit shall consist of submittal of a stormwater management and erosion control plan, prepared by a professional engineer licensed by the Commonwealth of Massachusetts, which meets the design requirements provided by this Ordinance. The plan shall include sufficient information to evaluate the environmental characteristics of the affected areas, the potential impacts of the proposed development on water resources; and the effectiveness and acceptability of measures proposed for managing stormwater runoff. The Plan must be designed to meet the Massachusetts Stormwater Management Standards as set forth in Section 29-6 of this ordinance and the DEP Stormwater Management Handbook Volumes I and II. The applicant shall certify on the drawings that all clearing, grading, drainage, construction, and development shall be conducted in strict accordance with the plan. The minimum information submitted for support of a stormwater management plan shall be as follows:

- A. A locus map,
- B. The existing zoning, and land use at the site,
- C. The proposed land use,
- D. The location(s) of existing and proposed easements,
- E. The location of existing and proposed utilities,
- F. The site's existing & proposed topography with contours at 2 foot intervals,
- G. The existing site hydrology,
- H. A description & delineation of existing stormwater conveyances, impoundments, and wetlands on or adjacent to the site or into which storm water flows.
- I. A delineation of 100-year flood plains, if applicable
- J. Estimated seasonal high groundwater elevation (November to April) in areas to be used for storm water retention, detention, or infiltration.
- K. The existing and proposed vegetation and ground surfaces with runoff coefficient for each,
- L. A drainage area map showing pre and post construction watershed boundaries, drainage area and storm water flow paths,
- M. A description and drawings of all components of the proposed drainage system including:
 - (1) locations, cross sections, and profiles of all brooks, streams, drainage swales and their method of stabilization,
 - (2) all measures for the detention, retention or infiltration of water,
 - (3) all measures for the protection of water quality,
 - (4) the structural details for all components of the proposed drainage systems and storm water management facilities,
 - (5) notes on drawings specifying materials to be used, construction specifications, and typicals, and
 - (6) expected hydrology with supporting calculations.
 - (7) Proposed improvements including location of buildings or other structures, impervious surfaces, and drainage facilities, if applicable,
 - (8) A description of construction and waste materials expected to be stored on-site, and a description of controls to reduce pollutants from these materials including storage practices to minimize exposure of the materials to storm water, and spill prevention and response.
 - (9) Timing, schedules, and sequence of development including clearing, stripping, rough grading, construction, final grading, and vegetative stabilization, and
 - (10) A maintenance schedule for the period of construction

Section 29-6. Stormwater Management Performance Standards

1. Minimum Control Requirements

Projects must meet the Standards of the Massachusetts Stormwater Management Policy. These Standards are:

- A. No new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or water of the Commonwealth.
- B. Stormwater management systems must be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.
- C. Loss of annual recharge to groundwater should be minimized through the use of infiltration measures to the maximum extent practicable. The annual recharge from the post-development site should approximate the annual recharge rate from the pre-development or existing site conditions, based on soil types.
- E. **For new development, stormwater management systems must be designed to remove 80% of the average annual load (post development conditions) of Total Suspended Solids (TSS). It is presumed that this standard is met when:**
 - (1) Suitable nonstructural practices for source control and pollution prevention and implemented;
 - (2) Stormwater management best management practices (BMPs) are sized to capture the prescribed runoff volume; and
 - (3) Stormwater management BMPs are maintained as designed.
- E. Stormwater discharges from areas with higher potential pollutant loads require the use of specific stormwater management BMPs (see Stormwater Management Volume I: Stormwater Policy Handbook). The use of infiltration practices without pretreatment is prohibited.
- F. Stormwater discharges to critical areas must utilize certain stormwater management BMPs approved for critical areas (see Stormwater Management Volume I: Stormwater Policy Handbook). Critical areas are Outstanding Resource Waters (ORWs), shellfish beds, swimming beaches, cold water fisheries and recharge areas for public water supplies.
- G. Redevelopment of previously developed sites must meet the Stormwater Management Standards to the maximum extent practicable. However, if it is not practicable to meet all the Standards, new (retrofitted or expanded) stormwater management systems must be designed to improve existing conditions.
- H. Erosion and sediment controls must be implemented to prevent impacts during disturbance and construction activities.
- I. All stormwater management systems must have an operation and maintenance plan to ensure that systems function as designed.

When the proposed discharge may have an impact upon a sensitive receptor, including streams, storm sewers, and/or combined sewers, the DPW may require an increase in these minimum requirements, based on existing stormwater system capacity.

2. Stormwater Management Measures

- A. Stormwater management measures shall be required to satisfy the minimum control requirements and shall be implemented in the following order of preference:

1. Infiltration, flow attenuation, and pollutant removal of runoff on-site to existing areas with grass, trees, and similar vegetation and through the use of open vegetated swales and natural depressions;
 2. Use of stormwater on-site to replace water used in industrial processes or for irrigation;
 3. Stormwater detention structures for the temporary storage of runoff which is designed so as not to create a permanent pool of water; and
 4. Stormwater retention structures for the permanent storage of runoff by means of a permanent pool of water.
 5. Retention and evaporation of stormwater on rooftops or in parking lots;
- B. Infiltration practices shall be utilized to reduce runoff volume increases. A combination of successive practices may be used to achieve the applicable minimum control requirements. Justification shall be provided by the applicant for rejecting each practice based on site conditions.
- C. Best Management Practices shall be employed to minimize pollutants in stormwater runoff prior to discharge into a separate storm drainage system or water body.
- D. All stormwater management facilities shall be designed to provide an emergency overflow system, and incorporate measures to provide a non-erosive velocity of flow along its length and at any outfall.
- E. The designed release rate of any stormwater structure shall be modified if any increase in flooding or stream channel erosion would result at a downstream dam, highway, structure, or normal point of restricted stream flow.

3. Specific Design Criteria

Additional policy, criteria, and information including specifications and design standards may be found in the Stormwater Design Manual.

A. Infiltration systems

1. Infiltration systems shall be equipped with clean stone and or filter fabric adjacent to the soil or other sediment removal mechanisms;
2. Infiltration systems greater than 3 feet deep shall be located at least 10 feet from basement walls;
3. Due to the potential for groundwater contamination from dry wells, they shall not be an acceptable method for management runoff containing pollutants;
4. Infiltration systems designed to handle runoff from commercial or industrial impervious parking areas shall be a minimum of 100 feet from any drinking water supply well;
5. Infiltration systems shall not be used as sediment control basins during construction unless specific plans are included to restore or improve the basin surface;
6. Infiltration basins shall be constructed with a three foot minimum separation between the bottom of the structure and the seasonal high groundwater elevation, as determined by a certified soil evaluator; and
7. Provisions shall be made for safe overflow passage, in the event of a storm which exceeds the capacity of an infiltration system.

- B. Retention and detention ponds shall be designed and constructed in accordance with the criteria of the Stormwater Management, Volume Two: Stormwater Technical Handbook (March, 1997, Mass. Department of Environmental Protection, as updated or amended).

- C. **The applicant shall give consideration in any plan to incorporating the use of natural topography and land cover such as natural swales, and depressions as they exist prior to development to the degree that they can accommodate the additional flow of water.**
- D. The Department of Public Works shall give preference to the use of swales in place of the traditional use of curbs and gutters based on a case by case review of stormwater management plans by the City Engineer and Department of Public Works.

- E. The applicant shall consider public safety in the design of any stormwater facilities. The banks of detention, retention, and infiltration basins shall be sloped at a gentle grade into the water as a safeguard against personal injury, to encourage the growth of vegetation and to allow the alternate flooding and exposure of areas along the shore. Basins shall have a 4:1 slope to a depth two feet below the control elevation. Side slopes must be stabilized and planted with vegetation to prevent erosion and provide pollutant removal. The banks of detention and retention areas shall be designed with sinuous rather than straight shorelines so that the length of the shoreline is maximized, thus offering more space for the growth of vegetation;
- F. Where a stormwater management plan involves direction of some or all runoff off of the site, it shall be the responsibility of the applicant to obtain from adjacent property owners any easements or other necessary property interests concerning flowage of water. Approval of a stormwater management plan does not create or affect any such rights.
- G. All applicants for projects which involve the storage or use of hazardous chemicals shall incorporate handling and storage "best management practices" that prevent such chemicals from contaminating runoff discharged from a site into infiltration systems, receiving water bodies or storm drains, and shall include a list of such chemicals in the application.
- H. Runoff from parking lots shall be treated by oil and water separators or other controls to remove oil and sediment;
- I. The basic design criteria methodologies, and construction specifications, subject to the approval of the Department of Public Works and City Engineer, shall be those generally found in the most current edition of the Stormwater Management, Volume Two: Stormwater Technical Handbook (March, 1997, Mass. Department of Environmental Protection, as updated or amended).

Section 29-7. Design Requirements for Erosion and Sediment Control Plan

- 1. The design requirements of the Erosion and Sediment Control Plan are:
 - A. Minimize total area of disturbance
 - B. Sequence activities to minimize simultaneous areas of disturbance.
 - C. Minimize peak rate of runoff in accordance with the MA DEP Stormwater Policy.
 - D. Minimize soil erosion and control sedimentation during construction. Prevention of erosion is preferred over sedimentation control.
 - E. Divert uncontaminated water around disturbed areas
 - F. Maximize groundwater recharge.
 - G. Install, and maintain all Erosion and Sediment Control measures in accordance with the manufacturers specifications and good engineering practices
 - H. Prevent off-site transport of sediment.
 - I. Protect and manage on and off-site material storage areas (overburden and stockpiles of dirt, borrow areas, or other areas used solely by the permitted project are considered a part of the project).
 - J. Comply with applicable Federal, State and local laws and regulations including waste disposal, sanitary sewer or septic system regulations, and air quality requirements, including dust control
 - K. Prevent adverse impact from the proposed activities to habitats mapped by the Massachusetts Natural Heritage & Endangered Species Program as Endangered, Threatened or of Special concern,

Estimated Habitats of Rare Wildlife and Certified Vernal Pools, and Priority Habitats of Rare Species.

- L. Institute interim and permanent stabilization measures. The measures shall be instituted on a disturbed area as soon as practicable but no more than 14 days after construction activity has temporarily or permanently ceased on that portion of the site.
- M. Properly manage on-site construction and waste materials.
- N. Prevent off-site vehicle tracking of sediments.

Section 29-8 Maintenance

1. Operation, Maintenance and Inspection Agreement

- A. Prior to issuance of any building permit for which stormwater management is required, the Department of Public Works shall require the applicant or owner to execute an operation, maintenance and inspection agreement binding on all subsequent owners of land served by the private stormwater management facility. The agreement shall be designed to ensure that water quality standards are met in all seasons and throughout the life of the system. Such agreement shall provide for access to the facility at reasonable times for regular inspections by the city or its authorized representative and for regular or special assessments of property owners to ensure that the facility is maintained in proper working condition to meet design standards and any provision established. The agreement shall include:
 - (1) The name(s) of the owner(s) for all components of the system.
 - (2) Maintenance agreements that specify:
 - (a) The names and addresses of the person(s) responsible for operation and maintenance.
 - (b) The person(s) responsible for financing maintenance and emergency repairs.
 - (c) A Maintenance Schedule for all drainage structures, including swales and ponds.
 - (d) A list of easements with the purpose and location of each.
 - (e) The signature(s) of the owner(s).
 - (3) Stormwater management easements as necessary for:
 - (a) Access for facility inspections and maintenance.
 - (b) Preservation of stormwater runoff conveyance, infiltration, and detention areas and facilities, including flood routes for the 100-year storm event.
 - (c) Direct maintenance access by heavy equipment to structures requiring regular cleanout.
 - (4) Stormwater management easement requirements:
 - (a) The purpose of each easement shall be specified in the maintenance agreement signed by the property owner.
 - (b) Stormwater management easements are required for all areas used for off-site stormwater control, unless a waiver is granted by the City.
 - (c) Easements shall be recorded with the Registry of Deeds prior to issuance of a Certificate of Completion.
 - (5) Changes to Operation and Maintenance Plans
 - (a) The owner(s) of the stormwater management system must notify the Department of Public Works] of changes in ownership or assignment of financial responsibility.
 - (b) The maintenance schedule in the Maintenance Agreement may be amended to achieve the purposes of this by-law by mutual agreement of the Department of Public Works] and the Responsible Parties. Amendments must be in writing and signed by all Responsible Parties. Responsible Parties must include owner(s), persons with financial responsibility, and persons with operational responsibility.
- B. The agreement shall be recorded by the applicant and/or owner in the land records of the Registry of Deeds.

- C. The agreement shall also provide that, if after notice by the City Engineer to correct a violation requiring maintenance work, satisfactory corrections are not made by the owner(s) within thirty days, the Department of Public Works may perform all necessary work to place the facility in proper working condition. The owner(s) of the facility shall be assessed the cost of the work and any penalties.

2. Maintenance Responsibility

- A. The owner of the property on which work has been done pursuant to this Ordinance for private stormwater management facilities, or any other person or agent in control of such property, shall maintain in good condition and promptly repair and restore all grade surfaces, walls, drains, dams and structures, vegetation, erosion and sediment control measures and other protective devices. Such repairs or restoration and maintenance shall be in accordance with approved plans.
- B. A maintenance schedule shall be developed for the life of any stormwater management facility and shall state the maintenance to be completed, the time period for completion, and who shall be legally responsible to perform the maintenance. This maintenance schedule shall be printed on the stormwater management plan.
- C. Records of installation and maintenance
- D. Failure to maintain practices

Section 29-9. Performance Bond

The Department of Public Works shall require from the developer a surety or cash bond, irrevocable letter of credit, or other means of security acceptable to the Department of Public Works prior to the issuance of any building permit for the construction of a development requiring a stormwater management facility. The amount of the security shall not be less than the total estimated construction cost of the stormwater management facility. The bond so required in this section shall include provisions relative to forfeiture for failure to complete work specified in the approved stormwater management plan, compliance with all of the provisions of this Ordinance and other applicable laws and regulations, and any time limitations. The bond shall not be fully released without a final inspection of the completed work by the City Engineer, submission of "As-built" plans, and certification of completion by the Department of Public Works of the stormwater management facilities being in compliance with the approved plan and the provisions of this Ordinance.

Section 29-10. Enforcement and Penalties

1. Violations

Any development activity that has commenced or is conducted contrary to this Ordinance may be restrained by injunction or otherwise abated in a manner provided by law.

2. Notice of Violation

When the Westfield Department of Public Works determines that an activity is not being carried out in accordance with the requirements of this Ordinance, it shall issue a written notice of violation to the owner of the property. The notice of violation shall contain:

- A. the name and address of the owner applicant;
- B. the address when available or the description of the building, structure, or land upon which the violation is occurring;
- C. a statement specifying the nature of the violation;
- D. a description of the remedial measures necessary to bring the development activity into compliance with this Ordinance and a time schedule for the completion of such remedial action;
- E. a statement of the penalty or penalties that shall or may be assessed against the person to whom the notice of violation is directed;
- F. a statement that the determination of violation may be appealed to the municipality by filing a written notice of appeal within fifteen (15) days of service of notice of violation.

3. Stop Work Orders

Persons receiving a notice of violations will be required to halt all construction activities. This “stop work order” will be in effect until the Westfield Department of Public Works confirms that the development activity is in compliance and the violation has been satisfactorily addressed. Failure to address a notice of violation in a timely manner can result in civil, criminal, or monetary penalties in accordance with the enforcement measures authorized in this Ordinance.

4. Criminal and Civil Penalties

Any person who violates any provision of this ordinance, valid regulation, or the terms or conditions in any permit or order prescribed or issued thereunder, shall be subject to a fine not to exceed \$300.00 for each day such violation occurs or continues or subject to a civil penalty, which may be assessed in an action brought on behalf of the City in any court of competent jurisdiction.

5. Non-Criminal Disposition

As an alternative to criminal prosecution or civil action, the City of Westfield may elect to utilize the non-criminal disposition procedure set forth in Westfield city ordinances. The Department of Public Works shall be the enforcing entity. The penalty for the 1st violation shall be up to \$100. The penalty for the 2nd violation shall be up to \$200. The penalty for the 3rd and subsequent violations shall be \$ 300.00. Each day or part thereof that such violation occurs or continues shall constitute a separate offense.

6. Restoration of Lands

Any violator may be required to restore land to its undisturbed condition. In the event that restoration is not undertaken within a reasonable time after notice, the Westfield Department of Public Works may take necessary corrective action, the cost of which shall become a lien upon the property until paid.

7. Holds on Occupancy Permits

Occupation permits will not be granted until corrections to all stormwater practices have been made and accepted by the Westfield Department of Public Works.

Section 29-11. Severability

The invalidity of any section or provision of this Ordinance shall not invalidate any other section or provision thereof.

DRAFT WESTFIELD STORMWATER ORDINANCE

CHAPTER 28

ILLICIT CONNECTIONS AND DISCHARGES TO THE STORM DRAIN SYSTEM

SECTION 28-1. PURPOSE and AUTHORITY

1. Purpose

The purpose of this ordinance is to regulate illicit connections and discharges to the storm drain system, which is necessary for the protection of Westfield's water bodies and groundwater, and to safeguard the public health, safety, welfare and the environment.

The objectives of this ordinance are:

- A. To prevent pollutants from entering Westfield's municipal separate storm sewer system (MS4);
- B. To prohibit illicit connections and unauthorized discharges to the MS4;
- C. To require the removal of all such illicit connections;
- D. To comply with state and federal statutes and regulations relating to stormwater discharges; and
- E. To establish the legal authority to ensure compliance with the provisions of this ordinance through inspection, monitoring, and enforcement.
- F. To prevent contamination of drinking water supplies.

2. Authority

The Department of Public Works shall administer, implement and enforce this ordinance. Any powers granted to or duties imposed upon the Department of Public Works may be delegated in writing by the Board of Public Works to employees or agents of the Department of Public Works.

SECTION 28-2. DEFINITIONS

For the purposes of this ordinance, the following shall mean:

Authorized Enforcement Agency: The Department of Public Works, its employees or agents designated to enforce this ordinance.

Best Management Practice (BMP): An activity, procedure, restraint, or structural improvement that helps to reduce the quantity or improve the quality of stormwater runoff.

Clean Water Act: The Federal Water Pollution Control Act (33 U.S.C. § 1251 *et seq.*) as hereafter amended

Discharge of Pollutants: The addition from any source of any pollutant or combination of pollutants into storm drain systems or into the waters of the United States or Commonwealth from any source.

Groundwater: All water beneath the surface of the ground.

Illegal Discharge: Any direct or indirect non-stormwater discharge to storm drain systems, except as specifically exempted in Section 6. The term does not include a discharge in compliance with an NPDES Storm Water Discharge Permit or resulting from fire fighting activities exempted pursuant to Section 6, subsection 4, of this ordinance.

Illicit Connection: Any surface or subsurface drain or conveyance, which allows an illegal discharge into storm drain systems. Illicit connections include conveyances which allow a non-stormwater discharge to storm drain systems including sewage, process wastewater or wash water and any connections from indoor drains sinks, or toilets, regardless of whether said connection was previously allowed, permitted, or approved before the effective date of this ordinance.

Impervious Surface: Any material or structure on or above the ground that prevents water from infiltrating the underlying soil.

Municipal separate storm sewer system (MS4) or municipal storm drain system: The system of conveyances designed or used for collecting or conveying stormwater, including any road with a drainage system, street, gutter, curb, inlet, piped storm drain, pumping facility, retention or detention basin, natural or man-made or altered drainage channel, reservoir, and other drainage structure that together comprise the storm drainage system owned or operated by the City of Westfield.

National Pollutant Discharge Elimination System (NPDES) Storm Water Discharge Permit: A permit issued by United States Environmental Protection Agency or jointly with the State that authorizes the discharge of pollutants to waters of the United States.

Non-Stormwater Discharge: Any discharge to the storm drain systems not composed entirely of stormwater.

Person: Any individual, partnership, association, firm, company, trust, corporation, and, any agency, authority, department or political subdivision of the Commonwealth or the federal government, to the extent permitted by law, and any officer, employee, or agent of such person.

Pollutant: Any element or property of sewage, agricultural, industrial or commercial waste, runoff, leachate, heated effluent, or other matter whether originating at a point or nonpoint source, that is or may be introduced into any sewage treatment works or waters of the Commonwealth. Pollutants shall include:

- (1) paints, varnishes, and solvents;
- (2) oil and other automotive fluids;
- (3) non-hazardous liquid and solid wastes and yard wastes;
- (4) refuse, rubbish, garbage, litter, or other discarded or abandoned objects, ordnances, accumulations and floatables;
- (5) pesticides, herbicides, and fertilizers;
- (6) hazardous materials and wastes; sewage, fecal coliform and pathogens;
- (7) dissolved and particulate metals;
- (8) animal wastes;
- (9) rock; sand; salt, soils;
- (10) construction wastes and residues;
- (11) and noxious or offensive matter of any kind.

Process wastewater means any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any material, intermediate product, finished product, or waste product.

Recharge: The process by which groundwater is replenished by precipitation through the percolation of runoff and surface water through the soil.

Stormwater: Runoff from precipitation or snow melt.

Storm Drain System: The system of conveyances designed or used for collecting or conveying stormwater, including any road with a drainage system, street, gutter, curb, inlet, piped storm drain, pumping facility, retention or detention basin, natural or man-made or altered drainage channel, reservoir, and other drainage structure that together comprise the storm drainage system on public or private ways within the City of Westfield.

Toxic or Hazardous Material or Waste: Any material, which because of its quantity, concentration, chemical, corrosive, flammable, reactive, toxic, infectious or radioactive characteristics, either separately or in combination with any substance or substances, constitutes a present or potential threat to human health, safety, welfare, or to the environment. Toxic or hazardous materials include any synthetic organic chemical, petroleum product, heavy metal, radioactive or infectious waste, acid and alkali, and any substance defined as Toxic or Hazardous under G.L. Ch.21C and Ch.21E, and the regulations at 310 CMR 30.000 and 310 CMR 40.0000.

Uncontaminated: Water containing no pollutants.

Watercourses: A natural or man-made channel through which water flows or a stream of water, including a river, brook or underground stream.

Waters of the Commonwealth: all waters within the jurisdiction of the Commonwealth, including, without limitation, rivers, streams, lakes, ponds, springs, impoundments, estuaries, wetlands, costal waters, and groundwater.

Wastewater: any sanitary waste, sludge, or septic tank or cesspool overflow, and water that during manufacturing, cleaning or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct or waste product.

SECTION 28-3. APPLICABILITY

This ordinance shall apply to flows entering the storm water and drainage system **on** public or private ways within the City of Westfield.

SECTION 28-4. REGULATIONS

The Board of Public Works may promulgate rules, regulations and a permitting process to effectuate the purposes of this ordinance. Failure by the Board of Public Works to promulgate such rules and regulations shall not have the effect of suspending or invalidating this ordinance.

SECTION 28-5. PROHIBITED ACTIVITIES

1. Illegal Discharges

No person shall dump, discharge, cause or allow to be discharged any pollutant or non-stormwater discharge into storm drain systems, watercourse, or into the waters of the Commonwealth.

2. Illicit Connections

No person shall construct, use, allow, maintain or continue any illicit connection to storm drain systems, regardless of whether the connection was permissible under applicable law, regulation or custom at the time of connection.

3. Obstruction Storm Drain Systems

No person shall obstruct or interfere with the normal flow of stormwater into or out of storm drain systems without prior approval from the Board of Public Works or its designated agent.

4. Exemptions

This section shall not apply to any of the following non-stormwater discharges or flows provided that the source is not a significant contributor of a pollutant to storm drain systems:

- A. Municipal waterline flushing;
- B. Discharges from landscape irrigation or lawn watering;
- C. Water from individual residential car washing and temporary fund-raising car wash events;
- D. Discharges from dechlorinated swimming pool water provided it is allowed to stand for one week prior to draining, or tested for chlorine levels with a pool test kit prior to draining (less than one parts per million chlorine), and the pool is drained in such a way as not to cause a nuisance;
- E. Discharges from street sweepers of minor amounts of water during operations;
- F. Discharges or flows resulting from fire fighting activities;
- G. Non-stormwater discharges permitted under an NPDES permit, waiver, or waste discharge order administered under the authority of the United States Environmental Protection Agency, provided that the discharge is in full compliance with the requirements of the permit, waiver, or order and applicable laws and regulations.

5. Exemptions with Permit from Department of Public Works

This section shall not apply to any of the following non-stormwater discharges or flows provided that the source is not a significant contributor of a pollutant to storm drain systems, provided that a permit is approved by the Department of Public Works:

- A. Flows from potable water sources;
- B. Springs;
- C. Natural flows from riparian habitats and wetlands;
- D. Diverted stream flows;
- E. Rising groundwater;
- F. Uncontaminated groundwater infiltration as defined in 40 CFR 35.2005(20), or uncontaminated pumped groundwater;
- G. Uncontaminated groundwater discharge from a sump pump, with a permit from the Department of Public Works, in accordance with Section 5;
- H. Water from exterior foundation drains, footing drains (not including active groundwater dewatering systems, such as dewatering excavations for foundation or pipelines), crawl space pumps, or air conditioning condensation;
- I. Dye testing, provided verbal notification is given to the Department of Public Works prior to the time of the test.

The Department of Public Works may develop criteria for issuing permits under this section, based on the need to maintain capacity of the storm drain system and to protect public health, safety, welfare or the environment.

SECTION 28-6. SUSPENSION OF STORM DRAINAGE SYSTEM ACCESS

1. The Department of Public Works may suspend storm drain system access to any person or property without prior written notice when such suspension is necessary to stop an actual or threatened illegal discharge that presents or may present imminent risk of harm to the public health, safety, welfare or the environment. In the event any person fails to comply with an emergency suspension order, the Authorized Enforcement Agency may take all reasonable steps to prevent or minimize harm to the public health, safety, welfare or the environment.
2. Any person discharging to a municipal storm drain system in violation of this ordinance may have their storm drain system access terminated if such termination would abate or reduce an illicit discharge. The Department of Public Works will notify a violator of the proposed termination of storm drain system access. The violator may petition the Department of Public Works for reconsideration and hearing. A person commits an offense if the person reinstates storm drain system access to premises terminated pursuant to this section, without prior approval from the Department of Public Works.

SECTION 28-7. NOTIFICATION OF SPILLS

Notwithstanding any other requirements of local, state or federal law, as soon as any person responsible for a facility or operation, or responsible for emergency response for a facility or operation has information of any known or suspected release of materials at that facility operation which is resulting or may result in illegal discharge of pollutants that person shall take all necessary steps to ensure containment, and cleanup of the release. In the event of a release of oil or hazardous materials, the person shall immediately notify the municipal fire and police departments, Department of Public Works and Board of Health. In the event of a release of non-hazardous material, said person shall notify the Authorized Enforcement Agency no later than the next business day. Written confirmation of all telephone, facsimile or in person notifications shall be provided to the Authorized Enforcement Agency within three business days thereafter. If the discharge of prohibited materials is from a commercial or industrial facility, the facility owner or operator of the facility shall retain on-site a written record of the discharge and the actions taken to prevent its recurrence. Such records shall be retained for at least three years.

SECTION 28-8. ENFORCEMENT

1. The Department of Public Works or its authorized agent shall enforce this ordinance, and the regulations promulgated thereunder, as well as the terms and conditions of all permits, notices, and orders, and may pursue all civil and criminal remedies for such violations.

2. Civil Relief

If anyone violates the provisions of this ordinance, regulations, permit, notice, or order issued thereunder, the Department of Public Works may seek injunctive relief in a court of competent jurisdiction to restrain the person from activities which would create further violations or compelling the person to abate or remediate the violation.

3. Orders

The Department of Public Works may issue a written order to enforce the provisions of this ordinance or the regulations thereunder, which may include: (a) elimination of illicit connections or discharges to the storm drainage system; (b) termination of access to the storm drainage system; (c) performance of monitoring, analyses, and reporting; (d) cessation of unlawful discharges, practices, or operations; and (e) remediation of contamination in connection therewith. If the Department of Public Works determines that abatement or remediation of contamination is required, the order shall set forth a deadline for completion of the abatement or remediation. Said order shall further advise that, should the violator or property owner fail to abate or perform remediation within the specified deadline, the City may, at its option, undertake such work, and expenses thereof shall be charged to the violator or property owner.

Within thirty (30) days after completing all measures necessary to abate the violation or to perform remediation, the violator and the property owner will be notified of the costs incurred by the City, including administrative costs. The violator or property owner may file a written protest objecting to the amount or basis of costs with the Department of Public Works within thirty (30) days of receipt of the notification of the costs incurred. If the amount due is not received by the expiration of the time in which to file a protest or within thirty (30) days following a decision of the Department of Public Works affirming or reducing the costs, or from a final decision of a court of competent jurisdiction, the costs shall become a special assessment against the property owner and shall constitute a lien on the owner's property for the amount of said costs. Interest shall begin to accrue on any unpaid costs at the statutory rate provided in G.L. Chapter 59, § 57 after the thirty-first day at which the costs first become due.

4. Criminal and Civil Penalties

Any person who violates any provision of this ordinance, valid regulation, or the terms or conditions in any permit or order prescribed or issued thereunder, shall be subject to a fine not to exceed \$300.00 for each day such violation occurs or continues or subject to a civil penalty, which may be assessed in an action brought on behalf of the City in any court of competent jurisdiction.

5. Non-Criminal Disposition

As an alternative to criminal prosecution or civil action, the City of Westfield may elect to utilize the non-criminal disposition procedure set forth in G.L. Chapter 40, §21D. The Department of Public Works shall be the enforcing entity. The penalty for the 1st violation shall be up to \$100. The penalty for the 2nd violation shall be up to \$200. The penalty for the 3rd and subsequent violations shall be \$ 300.00. Each day or part thereof that such violation occurs or continues shall constitute a separate offense.

6. Entry to Perform Duties under this Ordinance

To the extent permitted by state law, or if authorized by the owner or other party in control of the property, the Department of Public Works, its agents, officers, and employees may enter upon privately owned property for the purpose of performing their duties under this ordinance and regulations and may make or cause to be made such examinations, surveys or sampling as the Department of Public Works deems reasonably necessary.

7. Appeals

The decisions or orders of the Department of Public Works shall be final. Further relief shall be to a court of competent jurisdiction.

8. Remedies Not Exclusive

The remedies listed in this ordinance are not exclusive of any other remedies available under any applicable federal, state or local law.

SECTION 28-9. SEVERABILITY

If any provision, paragraph, sentence, or clause, of this ordinance shall be held invalid for any reason, all other provisions shall continue in full force and effect.

SECTION 28-10. TRANSITIONAL PROVISIONS

Residential property owners comply with this ordinance on a schedule set forth in the Department of Public Works compliance order, but such property owners shall in no case have more than six months from the effective date of the ordinance to comply with its provisions, unless good cause is shown for the failure to comply with the ordinance during that period.